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Advance Buying Is Lacking

About 75 Per Cent. of Finishing Capacity Active

Pig Iron Output Growing — Central Western Stocks Slightly Less

The indications in the iron and steel trades are not so plain nor so uniform as to make reports from the various markets of one tenor. In the main developments are still favorable. Steel works and rolling mills are making larger outputs than in February, and consumers generally are specifying to the maximum amounts stipulated in their contracts. New orders in some lines, however, are not meeting recent expectations.

The lack of the advance buying that has marked every great year in the steel trade may be given undue emphasis, in view of an average output up to 75 per cent. of capacity. But the bar trade, for example, recalls that just one year ago agricultural works were making large contracts running more than 12 months ahead. To-day consumers find no incentive to buy far ahead, either to insure deliveries or to forestall advances.

Some measure of the railroads' abstention from the market is found in a compilation by the leading interest showing that only 8 per cent. of last month's business was for railroad consumption, either directly or through car and other industries.

Structural work is more active, most of the larger new contracts being reported from the East, while the West has a good total of smaller business. The post-office at the Pennsylvania Railroad terminal, New York, 6400 tons, and the Masonic Temple, 3700 tons, have been closed by the leading interest, together with the Curtis Publishing Company warehouse at Philadelphia, 4000 to 5000 tons, and the American Building, Chicago, 5200 tons. At Los Angeles the Earle Building has been awarded, calling for 2200 tons.

The Great Northern has bought 10,000 tons of open hearth rails at Chicago, and an additional 10,000 tons closed there this week includes 6600 tons for two traction lines and a contracting company. The Chicago City Railways are in the market for 4000 tons, and the Pittsburgh Railways for 1700 tons of girder rails. Little railroad bridge work is pending, but the St. Paul is in the market for its requirements.

The wire mills have been running almost to capacity for some weeks and manufacturers are counting on a season of heavy consumption.

Merchant pipe and sheets have been backward lines, but specifications are now picking up.

Cut nail manufacturers at a meeting in Philadelphia advanced prices to $1.70. The trade is understood to have been well filled up on the old basis. The bolt and nut meeting left prices unchanged.

In cast iron pipe the demand from private water and gas companies keeps up quite well. Pittsfield,

Mass., will open bids March 27 on 3800 tons of water pipe, and bids will soon be asked on 7000 to 10,000 tons of 48-in. pipe for delivery in the Bronx, New York.

Pig iron production is growing, but the increase is almost all for steel making. The Steel Corporation blew in one Ohio, one South Chicago and one Gary furnace last week, and is now operating 72 per cent. of its pig iron capacity. Stocks at Ohio and Western Pennsylvania furnaces, including those of steel companies, decreased 7000 tons in February and 23,000 tons in the first half of March.

Foundry pig iron is less active and the advances recently asked for delivery in the second half of the year have not been established in all markets. In Southern iron several good sales have been made, and one 25,000-ton transaction in pipe iron is pending in the East. Buyers have been able to push the $11, Birmingham, basis farther into the year—at least to the end of the third quarter in some cases. In Northern Ohio, foundry iron for the second half has sold at $14.25, at furnace, which was also the Valley furnace basis on a round lot closed at Pittsburgh for the same delivery.

A sale of 5000 tons of ferromanganese has been made at less than $36.75, Baltimore, delivery in Western Pennsylvania from October, 1911, to March, 1912.

Old material prices are receding. Rolling mills are not taking deliveries as fast as dealers would like and steel works are buying sparingly.

Arrivals of tin have been very heavy—a total of 4437 tons for March thus far, and nearly all of it for delivery into consumption. The unusual premiums paid recently on New York sales have dwindled to ⅛c. and ¼c.

Our Approaching Removal

The David Williams Company, publisher of *The Iron Age, Iron Age-Hardware, Metal Worker, Plumber and Steam Fitter* and *Building Age,* will remove its entire business from 14 Park place to 239 West Thirty-ninth street, between Seventh and Eighth avenues, New York City, and expects to be established in its new quarters in the week beginning April 10.

Several reasons have influenced the company when making this selection of a new habitation so far from the district in which it has so long conducted its operations. During the history of these various publications, the office has been frequently removed, but it has always been within a short distance of the central post-office. Convenience to the post-office was the prime consideration. This motive no longer applies, arrangements with the New York post-office now being in effect whereby our publications are sent directly to the Pennsylvania and New York Central trains without passing through the post-office. For some time many of the business interests of New York have found it advisable to seek locations further north in the city. The trend has been steadily in the direction of the district extending from Twenty-third street to Forty-second street. In this locality are found most of the important hotels, great retail stores and leading places of amusement. The out-of-town visitor finds himself in that locality more frequently than in any other part of the city. The recent opening of the great Pennsylvania Railroad station at Thirty-third street and Seventh avenue has emphasized this movement.

The new location of our office is almost midway between the Pennsylvania Railroad and New York Central stations and is within walking distance from either. It will therefore be easy of access to out-of-town visitors traveling on lines using these terminals. It will also be within easy reach of the great new post-office which will occupy a portion of the Pennsylvania Railroad Company's ground on Eighth avenue. An important advantage which will be gained will consist in having the printing office under the same roof with the business and editorial offices. Much inconvenience has been suffered for a long time in the separation of the mechanical and editorial departments, the printing office being at some distance. The new quarters will also afford much more room for the present working force, as well as provide ample space for growth, which, we are pleased to say, seems assured.

Visitors will be welcomed in the new quarters, as they always have been in the old ones. Ample provision will be made for them, including writing facilities for those living out of the city and who sometimes may find it difficult to secure conveniences of this kind while temporarily in the city. The files of our various publications and our extensive collection of trade catalogues will also be at their service for reference.

The Steel Corporation's Production Statement

Since the United States Steel Corporation rounds out a decade with the end of the present month, its last annual report which has just been made public is of peculiar interest. Repeatedly attention has been called to the relation between the production of the Steel Corporation and the total output of the other steel companies. Opportunely the American Iron and Steel Association's statistics of the country's steel ingot and castings production in 1910 are published this week, making possible a computation of the Steel Corporation's percentage for that year. The country produced the stupendous total of 26,094,919 gross tons of steel ingots and castings, and the Steel Corporation 14,179,369 tons, or 54.3 per cent. The production of independent companies last year was greater than any preliminary estimate had allowed for, and the Steel Corporation's percentage thus falls to its lowest. For several years it has been a fraction over 56, while in 1901, the Steel Corporation's first year, it was 66.2. However, this falling off in the percentage of steel produced by the Corporation can only be rightly interpreted in the light of one outstanding fact—the increasing percentage of its ingot production which enters into the more highly finished forms. The Corporation has been steadily at work diversifying its output and the higher priced forms—those which represent the greatest amount of work in the mill—are a larger proportion than ever. Mere tonnage is, therefore, of less significance in a study of these statistics than character of tonnage.

A very interesting comparison of the four pre-eminent years in the steel trade is possible, with the Steel Corporation's complete figures for 1910 before us. From the following table we have omitted 1908 as being an interval of suspended animation. The items selected give an epitome of the Corporation's operations—the production of Lake Superior ore, of pig iron and steel ingots, of finished products for sale, total earnings and earnings per ton of product. The last of

these items is not to be taken as an accurate average of finished steel prices. It is greater than such average price, since it includes the important factor of railroad earnings as well as profits from cement and various by-products. As is well known, the earnings of the two Minnesota ore roads and its Bessemer road from outside traffic are considerable:

United States Steel Corporation's Production in 1906, 1907, 1909 and 1910.—Gross Tons.

	1910.	1909.	1907.	1906.
Lake ore*...	23,204,515	21,606,184	22,403,801	20,645,148
Pig iron†...	11,831,398	11,618,350	11,422,795	11,267,377
Bess. ingots.	5,796,223	5,846,300	7,556,460	8,072,655
O. H. ingots.	8,383,146	7,508,889	5,786,532	5,438,494
Total ingots.	14,179,369	13,355,189	13,342,992	13,511,149
Steel rails..	2,118,473	1,719,486	1,879,985	1,982,042
Fin. products	10,733,995	9,859,660	10,376,742	10,578,433
Earnings	$141,054,754	$131,491,413	$160,964,673	$156,624,273
Earn. per ton.	$13.14	$13.34	$15.51	$14.80

* Shipments. † Includes ferro and spiegel.

With due allowance for earnings apart from those on steel, the above averages per ton are much above those of the various independent steel companies. The reports of the latter in recent years have shown profits of from $4 to $6 a ton. Without going narrowly into all the reasons for the difference between these figures and the average of more than $14 in the above table, it may be attributed in the main to the great diversity of the Steel Corporation's output and its large tonnage of the lighter and more highly finished products. It is to be noted in connection with the table that the profits in the omitted year of depression, 1908, were $91,847,710 on 6,206,932 tons, or an average of $14.80, exactly the same as for 1906.

In the following table a comparison is made between the production of the Steel Corporation subsidiaries in 1902, the first full year of the Corporation, and that of 1910:

Production of the United States Steel Corporation in 1902 and 1910.—Gross Tons, Except Wire Products and Finished Structural Work, Which Are in Net Tons.

	1910.	1902.
Blast furnace products	11,831,398	7,975,530
Bessemer ingots	5,796,223	6,759,210
Open hearth ingots	8,383,146	2,984,708
Total ingots	14,179,369	9,743,918
Finished products:		
Steel rails	2,118,473	1,920,786
Blooms, billets, sheet bars, &c. (a)	682,364	782,637
Plates	929,020	649,541
Merchant steel, bars, skelp, hoops, bands, &c. (b)	1,527,506	1,254,560
Heavy structural shapes	656,797	.....
Tubing and pipe (c)	868,550	744,062
Wire rods	133,722	109,330
Wire and products of wire (d)	1,490,318	1,122,809
Sheets and tin plates (e)	1,082,787	783,576
Finished structural work (f)	589,228	481,029
Angle splice bars and joints	235,998	139,954
Spikes, bolts, nuts and rivets	71,326	42,984
Axles	101,066	136,787
Steel car wheels	98,105	.....
Sundry iron and steel products	148,735	29,177
Total finished products	10,733,995	8,197,232
Spelter	26,777	23,982
Copperas	33,684	14,224
Cement, barrels	7,001,500	486,357

(a) Maximum, 1,253,682 tons in 1905. (b) Includes shapes in 1902. (c) Maximum, 1,174,629 tons in 1907. (d) Maximum, 1,607,689 tons in 1909. (e) Maximum, 1,112,542 tons in 1906. (f) Maximum, 719,887 tons in 1907.

The total for 1910—10,733,995 tons— is not so much beyond that of 1902 as might be expected from the important additions to capacity which eight years have brought. The report just issued says that about 80 per cent. of capacity was utilized last year, so that in a year of full demand more than 13,400,000 tons of finished steel could be produced. What is of chief interest in the table is the indication it gives of the lines followed in the expansion of the Corporation's business. Rails have practically stood still, and blooms, billets and sheet bars have declined. From the maximum of 1,253,682 tons of semi-finished steel marketed as such in 1905, the falling off has been nearly 50 per cent. Sheets and tin plates have grown, but last year did not reach their maximum of 1,112,542 tons in 1906. Wire products expanded to 1,607,689 tons in 1909, but fell away from that maximum last year. A remarkable increase is that in merchant steel bars and shapes. These were grouped together in 1902, when the total was 1,254,560 tons. Last year merchant steel, bars, etc., and the now separated item of "heavy structural shapes" amounted together to 2,184,303 tons, an increase of more than 70 per cent. Tubing and pipe at 868,550 tons last year was considerably short of the maximum of 1,174,629 tons in 1907.

A striking feature of the table is the decline in Bessemer steel ingots from 6,759,210 tons in 1902 to 5,796,223 tons last year, while open hearth ingots made the remarkable increase of 5,398,438 tons or more than 180 per cent.

Accidents and Safeguards in England

The report of the British Home Office Departmental Committee on Accidents in Factories and Workshops contains much material of value to American employers of labor in connection with the workmen's compensation acts projected or already in operation in this country. The committee goes into many details of the causes of accidents and the means which should be adopted for their prevention. The investigation had its origin in certain alarmist statements made in the House of Commons—similar to those frequently heard on this side of the ocean—to the effect that there was a large increase in the number of accidents and an augmentation in accident risks. The committee finds that the accident risk for the 10 years 1897 to 1907 probably remained almost constant, and that since that period the tendency of the risk has been to decrease, though it is still much too great. Any increase due to the greater amount of machinery in use and the higher pressure of working conditions has been counteracted by improved inspection, by the greater care resulting from the adoption of the workmen's compensation acts and by the circumstances that in many instances of themselves introduced elements of safety.

Including all factories, the committee finds that the number of injured workers compensated under the workmen's compensation act equaled 27 per 1000 persons employed, and that in metal working the proportion was 67.3; in engine building, 65.1; in woodworking, 44.7, and in other metal industries, 33.9. When docks, mines and transport trades are included, the average number is 50.7 per 1000, those in the mines numbering 158.6; on docks, 90.1; on constructional work, 79.6; in collieries, 63.2, and on railroads, 47.2. Contrary to the usual belief, the rate of accidents in cotton factories was 16.7 and in woolen factories 8.8, both exceedingly low.

As to the contention that the risk of accident is augmented by the increased speed of production and the pressure imposed on the worker owing to modern competitive conditions, the committee states that it is unable to get any scientific evidence as to industrial fatigue, and thinks it would be instructive to take, by some of the recognized scientific tests, fatigue measure-

ments of a number of workers, with a view to discover whether there is any correlation between the degree of fatigue and the accident risk. The report quotes the factory inspectors employed under the factory act as believing that machinery is not run so fast as to be dangerous, and as not being able to trace particular accidents to the speed of the machines. In their opinion higher speed can only be regarded as a minor tendency toward increased accident risk. The trouble, according to these observers, is that machine operators when engaged in piecework or on the premium system adopt expedients which are not prudent, which in some measure nullifies the provisions made for the prevention of accidents. In this connection the committee urges most rigid inspection of equipment on the part of men employed for the purpose by the manufacturer, as well as by the Government inspectors, the two working jointly with the inspectors of the companies which insure against loss through workmen's compensation.

The committee strongly recommends the use of preventive measures as a matter of the first importance, but at the same time the avoidance as far as possible of any departure radically affecting inevitable economic conditions. The difficulty of the employer and the factory inspector getting together in these details has been a lack of uniformity in the requirements, and the consequent handicap of one firm as compared with another in meeting these requirements. The committee strongly advocates that a conference between the representatives of employers, work people and inspectors, and also, in some cases, of manufacturers of machinery, should be held at reasonable intervals for the purpose of discussing the requirements in a particular trade or in a particular district, and the best means of preventing accidents. Such a conference would deal not only with the guarding of particular types of machines, but the planning of works so as to avoid overcrowding of machinery, methods of avoiding injurious weight carrying, the maintenance of floors in a safe condition, arrangements for cleaning machinery, the lighting of factories and other matters. When agreements are arrived at regarding any condition applicable in all works, compliance should be enforced at once by prosecution under the factory act.

The committee found no evidence of the view sometimes taken that employers feel relieved of their responsibility, both from the moral and financial point of view, by insuring under the workmen's compensation act. Augmented risks, due to whatever cause, and indicated by increased numbers of accidents, involve higher insurance premiums both in the mutual and in the regular line companies. Every insurance company, in view of competition, must take steps to keep the accident rate as low as possible. These companies have inspectors, make regulations, call attention to dangers and arrange differential rates according to the degrees of danger associated with particular industries and even with particular works.

Our Record Production of Steel in 1910

The American Iron & Steel Association has ascertained the production of all kinds of steel in the United States in the calendar year 1910, both ingots and direct castings being included. A new record was made, all previous years having been far surpassed. The production of Bessemer steel was 9,412,772 gross tons; of open-hearth steel, 16,504,509 tons; of crucible steel, 122,303 tons; of electric and miscellaneous steel, 55,335 tons. The total production of steel was 26,094,919 tons, against a total production of 23,955,021 tons in 1909, when the largest output up to that time was reached.

Thomas J. Bray

Presiden tof the Republic Iron & Steel Company

Chairman John A. Topping of the Republic Iron & Steel Company announces that Tracy W. Guthrie, president of the company, has tendered his resignation as president and director to engage in other business. Chairman Topping adds that the resignation has been accepted with regret by the Executive Committee, and

THOMAS J. BRAY.

that Mr. Guthrie leaves the company with the good will of his associates. He will continue to act in a consulting capacity temporarily. Mr. Guthrie is succeeded by J. T. Bray, formerly vice-president, in charge of the operating department. H. L. Rownd, formerly secretary and treasurer, becomes vice-president and treasurer, and Richard Jones, Jr., general attorney for the company, has been elected secretary.

Mr. Guthrie, who had previously been connected with Hocking Valley coal interests, with headquarters at Columbus, Ohio, came into the Republic Iron & Steel Company in 1906 as assistant to President Topping. In 1907, when Mr. Topping was made chairman, Mr. Guthrie was elected president.

Thomas J. Bray, the new president, was born in Pittsburgh in 1867 and attended the Pittsburgh schools and high school in that city. His first employment was as an apprentice in the machine shops of the Lewis Foundry & Machine Company on the South Side, Pittsburgh. He then worked a short time at the Riverside Iron Works, Wheeling, W. Va., as a patternmaker and afterward was employed in the drawing offices of the Lewis Foundry & Machine Company for three years. He left that company in 1890, going to Lehigh University, where he graduated in 1894 as a mechanical engineer. He went with the Ohio Steel Company in 1894 for a short time and then entered the employ of McGill & Co., founders and machinists, Pittsburgh. Upon the taking over of that company by the United Engineering & Foundry Company, he was made

chief engineer of the latter concern from its organization, continuing in that capacity up to 1905. From 1905 he has been connected with the Republic Iron & Steel Company. He was assistant to the president, and in 1907 was made vice-president in charge of the operating department. His promotion to the presidency of the company is a well deserved recognition of ability. Mr. Bray is a brother of Charles W. Bray, who for some years was president of the American Sheet & Tin Plate Company, but retired from active business a few years ago.

New Publications.

Mechanics for Engineers. By Arthur Morley. Bound in cloth. Size, 5 x 7½ in.; 290 pages; 199 diagrams. Price $1.20. Published by Longmans, Green & Co., Fourth avenue and Thirtieth street, New York City.

The work is a text book of the intermediate standard intended to provide a suitable course in the principles of mechanics for engineering students. The ground covered by the book is that required by several of the prominent English educational institutions. The aim has been to select a course through which the student can work in a year rather than to treat a wide range of academic problems, and the principles have been illustrated as far as the exclusion of technical knowledge and terms would allow by examples likely to be most useful to the engineer. Graphical methods of solving problems have in some cases been used, as the author believes that such exercises while taking more time than the easy arithmetical ones, which are framed to give exact answers, compel the student to think of the relations existing between the quantities involved instead of merely performing the operations by fixed rules.

The book is divided into 10 chapters and an appendix contains a number of questions selected from the examination papers of the London University, the Institution of Civil Engineers and the Board of Education. The first three chapters are devoted to kinematics, laws of motion and work, power and energy, and a simple harmonic motion, together with motion in a circle, is discussed in chapter IV. Statics, concurrent forces and friction are covered in the next chapter, and in chapter VI the statics of rigid bodies is taken up. The next two chapters are concerned with the centers of inertia and gravity and their properties and applications, while chapter IX is given over to moments of inertia and rotation. The final chapter is devoted to the elements of graphical statics and deals with the preparation of diagrams and scales showing the action of various forces upon a point and the different stresses occurring in framed structures, girders, roofs, loaded chains and strings. Problems are given at the end of each chapter and the answers to these follow the appendix containing the examination questions. A comprehensive index of the different subjects treated completes the volume.

A Practical Guide to Iron and Steel Works Analyses. By Walter Macfarlane. Size, 5 x 7 in.; pages, 184; 9 illustrations. Bound in cloth. Price, $1.25 net. Published by Longmans, Green & Co., Fourth avenue and Thirtieth street, New York City.

This book is a series of selections from "Laboratory Notes on Iron and Steel Analyses," to meet the requirements of those who do not wish to pursue a full analytical course. These notes were first written for the guidance of a staff in an iron and steel works laboratory, which was for some years under the supervision of the author and were the results of over 40,000 estimations placed on record annually. The methods had to be reliable and rapid so as to control and keep pace with the manufacturing operations. An effort has been made to give the complete course of an assay or an analysis in full detail, and precise quantities of chemicals and the most convenient sizes of beakers and other laboratory apparatus are specified.

This book is divided into nine sections dealing with the analysis of steel, pig iron, limestone, calcined limestone, dolomite and solid fuels; the estimation of iron, general notes on laboratory operations and appliances and notes on preparing and storing solutions. In each of the first two sections the processes by which carbon, silicon, phosphorus, manganese and sulphur are estimated are given in considerable detail. In the section dealing with the analysis of solid fuels, which is a new one, the estimations of moisture, ash, coke and sulphur are all described. Various methods of estimating iron are described, and in the last two sections instructions are given on the performing of the various laboratory operations and the preparation and storing of the different solutions required in iron and steel works analysis.

Dynamo Electric Machinery. By Samuel Sheldon, Ph.D., and Erich Hausmann. Eighth edition, completely rewritten. Bound in cloth. Size, 5½ x 8 in.; pages, 328; 210 illustrations and diagrams. Price, $2.50 net. Published by D. Van Nostrand Company, New York City.

The latest edition of this book dealing with the construction, design and operation of direct current machines, like its predecessors, is primarily a text book for students. The matter is presented in a way which is especially adapted for a course consisting of recitations and occasional lectures supplemented by work in the laboratory. The sequence of the treatment is such that any part not required by students taking other than electrical courses can be omitted without destroying the continuity in the remaining matter, or the volume can be used by one who is not a student to gain a knowledge of certain particular phases of the subject.

With the exception of the first two chapters the book has been entirely rewritten, and its scope considerably extended. The new matter includes problems at the end of each chapter, a presentation of the theory of commutation, means for predetermining the operating characteristics of direct current generators and motors, a discussion of the storage battery from an engineering viewpoint, a treatment of the theory of balancers and boosters and a discussion of cost prices and operating expenses of different types of machines and plants. An almost entirely new set of illustrations has been substituted, most of which were specially drawn to make clear methods of construction or characteristics of operation. Certain chapters on design of machines and tests have been omitted, because adequate treatment requires more space than can be spared in so general a book.

The first two of the nine chapters deal with electrical and magnetic laws. Following these are chapters on armatures, field magnets and armature reaction. Chapter VI. is devoted to generators, and is divided into three sections, the first dealing with efficiency of operation, the next with constant-potential generators and the last with constant-current machines. In the next chapter motors are similarly treated, and after a general discussion of the principle of action, armature reaction and power, the shunt and the series types are described, and special reference is made to the industrial applications of both kinds for driving machine tools and in rolling mills. Chapter VIII. deals with auxiliary apparatus, such as dynamotors, motor generators, boosters and storage batteries, and the final chapter contains instructions for operating central station equipment.

About 100 molders and core makers employed by the Goulds Mfg. Company, Seneca Falls, N. Y., are on a strike. No question of wages is involved, but the molders objected to an increase in the number of molding machine operatives. Heretofore the machine issue has not been raised as molding machine men were counted as apprentices, but when the company increased the number of machine men beyond the basis of the apprentice ratio the molders protested and later went out.

The Fort Worth Wagon Factory, Fort Worth, Tex., is now finishing its buildings and hopes to be turning out wagons within 90 days. This company is incorporated for $150,000, and not $15,000, as reported in *The Iron Age* of March 9. It will manufacture high grade farm wagons. I. H. Burney is president; Van Zandt Jarvis, vice-president; C. Hightower, secretary and treasurer; Warren Heaton, manager.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.22, 1911.	Mar.15, 1911.	Feb.22, 1911.	Mar.23, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$18.00
Foundry No. 2, Valley furnace	13.75	13.75	13.75	16.25
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	16.25
Foundry No. 2, Birmingham, Ala.	11.00	11.00	11.00	13.00
Foundry No. 2, local, Chicago	15.50	15.50	15.50	18.25
Basic, delivered, eastern Pa.	15.25	15.25	14.50	18.00
Basic, Valley furnace	13.75	13.75	13.75	16.00
Bessemer, Pittsburgh	15.90	15.90	15.90	18.40
Gray forge, Pittsburgh	14.40	14.40	14.40	16.15
Lake Superior charcoal, Chicago	17.50	17.50	17.50	19.00
COKE, CONNELLSVILLE,				
Per Net Ton, at oven:				
Furnace coke, prompt shipment	1.55	1.55	1.45	2.00
Furnace coke, future delivery	1.75	1.75	1.60	2.25
Foundry coke, prompt shipment	2.00	2.00	2.00	2.60
Foundry coke, future delivery	2.25	2.25	2.25	2.75
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.00	32.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh	29.00	29.00	29.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	*14.50*	15.50	15.50	19.00
Iron rails, Philadelphia	18.50	18.50	18.00	20.50
Car wheels, Chicago	13.25	13.25	13.00	17.00
Car wheels, Philadelphia	14.00	14.00	14.00	16.75
Heavy steel scrap, Pittsburgh	*14.00*	14.25	14.75	17.00
Heavy steel scrap, Chicago	12.00	12.00	12.50	15.00
Heavy steel scrap, Philadelphia	14.00	14.00	14.50	16.50
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.37½	1.37½	1.37½	1.55
Common iron bars, Chicago	1.27½	1.27½	1.30	1.55
Common iron bars, Pittsburgh	1.35	1.35	1.35	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.61
Steel bars, Pittsburgh	1.40	1.40	1.40	1.45
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.30	1.30	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.80	1.80	1.75	1.85
Cut nails, Pittsburgh	1.70	1.60	1.60	1.85
Barb wire, galv., Pittsburgh*	2.10	2.10	2.05	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.75	13.75
Electrolytic copper, New York	12.25	12.25	12.37½	13.37½
Spelter, New York	5.65	5.65	5.60	5.73
Spelter, St. Louis	5.50	5.50	5.45	5.58
Lead, New York	4.40	4.37½	4.42½	4.45
Lead, St. Louis	4.25	4.22½	4.27½	4.30
Tin, New York	40.50	39.75	44.75	32.35
Antimony, Hallett, New York	*9.12½*	9.25	8.00	8.25
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter, 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.10
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, 20, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	78	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	50	49	55	45

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		Plugged and Reamed.
1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt
2, 2½ to 4 in.	Lap Weld	or Lap Weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $29 to $30 per gross ton. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed $1.60, galvanized $1.90; carload lots, to retailers, annealed $1.65, galvanized $1.95. Galvanized barb wire, to jobbers, $2.10; painted, $1.80. Wire nails, to jobbers, $1.80.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.75	1.80	1.85	1.90	2.00	2.10	2.20	2.30
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.80	2.90

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, March 22, 1911.—(*By Telegraph.*)

Pig Iron.—There is a good deal of new inquiry for malleable Bessemer and foundry iron, but there is very little doing in standard Bessemer or basic. The Iron City Sanitary Mfg. Company has bought a round tonnage of Northern No. 2 foundry at a little under $14, Valley furnace, for delivery prior to July 1, and $14.25, Valley furnace, for second half delivery. The Westinghouse Machine Company is in the market for about 2000 tons of No. 2 for third quarter delivery. We note sales of close to 1500 tons of malleable Bessemer at about $13.75, Valley furnace, for second quarter delivery. We quote Bessemer pig iron, $15; malleable Bessemer, $13.75; basic, $13.75 to $14; No. 2 foundry, $13.75 to $14, and gray forge, $13.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—There is not much new inquiry, nearly all consumers being covered by special contracts, but specifications for billets and sheet and tin bars are quite active. Shipments of steel by the mills are heavier than for some time. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

Some lines are holding up well in demand, while others have fallen off, a fair average being maintained. The billet and rail sales department of the Carnegie Steel Company reports that actual orders so far this month show a slight increase over the same period in February, which was a very good month. Pig iron consumers as a rule are buying cautiously, not being convinced that present prices will hold. Bessemer and basic iron are quiet, but foundry is fairly active. A sanitary interest has bought quite a large tonnage, and one of the Westinghouse companies has also been a buyer. Bessemer remains firm at $15, basic $14 for forward delivery, No. 2 foundry $13.75 to $14 and malleable Bessemer about $14, all at furnace. Consumers are specifying quite freely against their contracts for billets and sheet bars and the steel market is firm. In finished iron and steel the demand on the whole is not as active as it was a month ago, but there is a hopeful feeling that with the advent of spring trade it will show an increase. The scrap market is dull and prices have declined. Coke is in better demand with prices slightly higher.

Ferromanganese.—Prices continue weak, and new demand is quiet. A sale of about 200 tons of foreign 80 per cent., for delivery over the second half of the year, has been made at a price very close to $38, Baltimore. We quote 80 per cent. foreign for prompt shipment at $37.25 to $37.50 and for the second half at about $38, Baltimore. The freight rate to the Pittsburgh district is $1.95 a ton.

Ferrosilicon.—Inquiry is light and prices are weak. A recent sale of about 250 tons for forward delivery is reported at a price very close to $53, Pittsburgh. We quote 50 per cent. at $53.50 to $54, f.o.b. Pittsburgh, for delivery up to July; 10 per cent. blast furnace silicon, $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Muck Bar.—An inquiry for 500 tons is reported in the market, on which quotations of $29.50 to $30 have been made. We quote best grades of muck bar, made from all pig iron, at $29.50 to $30, Pittsburgh.

Skelp.—A sale of 1500 tons of sheared iron plates for second quarter delivery is reported on the basis of about 1.72½c., Pittsburgh. The demand is fairly active. The mills in this district have a moderate amount of business on their books. We quote grooved steel skelp at 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Wire Rods.—New inquiry is light. Most consumers covered their requirements some time ago up to July 1 or longer, specifications against which are coming in at a satisfactory rate. Few surplus rods are being offered in this market, most producers needing their entire output for their own wire mills. The second rod mill just contracted for by the Jones & Laughlin Steel Company, to be built at Aliquippa, Pa., will make that company one of the largest producers of rods in this district. Prices are firm, and we quote Bessemer, open hearth and chain rods at $29 to $30, Pittsburgh.

Steel Rails.—The Carnegie Steel Company has taken an order for 3000 tons of standard sections for a domestic railroad in addition to numerous smaller orders, and has also booked considerable tonnage in standard sections for export. The demand for light rails is active, and in the past week the same company received new orders for about 3200 tons and specifications against contracts for about 900 tons. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per pound.

Plates.—The Pittsburgh & Lake Erie is in the market for 1000 hopper and 1000 gondola cars; Western Maryland for 500 hopper cars; New York, Westchester & Boston for 30 pay-as-you-enter steel street cars; Barrett Mfg. Company for 50 to 75 100,000-lb. tank cars; General Chemical Company for 20 steel tank cars; Montreal Street Railway Company for 50 steel street cars; Pittsburgh Steel Company for 25 steel flat cars; Duluth, Messabi & Northern for 6 steel passenger and 2 steel baggage and mail cars; Eastern Kentucky Railroad for 20 flat cars and American Limestone Company for 12 steel cars. It is said that several of the leading railroads that had inquiries about ready for a large number of steel cars have withdrawn these and will not buy for the present. The contract for the gas holder for the Philadelphia Company in this city has not been given out, and it now looks as though the company will not build it at present. New demand for plates in the past two or three weeks has been dull, and all the mills are in need of orders. We quote ¼-in. and heavier plates at 1.40c., Pittsburgh.

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Structural Material.—The American Bridge Company has taken 500 to 600 tons of bridge work for the Wabash Railroad but aside from this no local jobs have been given out and fabricating concerns report conditions quieter than for some months. There is not much inquiry, and it is nearly all for small work. It is also stated that the small business that is being placed is being taken at very low prices. We quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Tin Plate.—Part of the present activity among the tin plate mills is due to the fact that domestic makers have been able to secure a larger proportion than usual of the re-export business in tin plate. The Standard Oil Company, Texas Company and one or two other concerns have placed heavy contracts with American mills which otherwise would have gone to Welsh mills but for the fact that the latter are so well filled with work that they cannot take care of such orders. This business has been done at prices that give the mills a fair margin of profit. While the new demand for tin plate is dull, the large consumers are specifying freely against contracts they placed in the last two months of 1910. We quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Sheets.—The present condition of the sheet trade is not satisfactory to the mills, the demand being only fair, while specifications against contracts are not coming in as they should. The leading sheet mills generally are not operating to more than about 60 per cent. of capacity. Regular prices in effect on the different grades are printed on a previous page.

Bars.—Prices on iron bars are reported a little firmer, and the regular price of 1.40c. on steel bars, which has prevailed for so long, is being firmly held. The demand for both iron and steel bars is light, and specifications against contracts are coming in only moderately well. We quote steel bars at 1.40c. and common iron bars at 1.35c. to 1.40c., Pittsburgh.

Spelter.—The market is dull and prices are weak. We quote prime grades of Western at 5.40c., East St. Louis, equal to 5.52½c., Pittsburgh.

Merchant Steel.—Several mills report that specifications against contracts are coming in reasonably well, but the new demand is only for small lots to cover actual needs. Consumers are apparently not convinced that present prices will be maintained. We quote the higher grades of merchant steels, f.o.b. Pittsburgh, as follows: Iron finished tire, ½ x 1½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—The new demand is mostly for small lots, but specifications against orders are rather satisfactory. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets are being shaded on desirable orders.

Wire Products.—The wire trade is active, several makers reporting that old contracts taken on the basis of $1.70 for wire nails have been about cleaned up, and most contracts on their books are now at $1.75 and $1.80. Consumption this year promises to be heavy. Several of the leading makers of fencing report that they are oversold and considerably behind in deliveries. We quote galvanized barb wire at $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; wire nails, $1.80; and cut nails, $1.60 to $1.65, f.o.b. Pittsburgh, full freight to destination added.

Spikes.—Inquiries for considerable tonnage are in the market from two or three of the Western roads. The Northern Pacific is reported to have placed 3000 to 5000 kegs with a Western mill. Prices are reported firm, at $1.55 for base sizes. Commencing April 1 the price will be $1.60. Following is the list of extras now in force:

Railroad Spikes.

4½, 5 and 5½ x 5/16	$1.55
3, 3½, 4, 4½ and 5 x ½	Extra .10
3½, 4 and 4½ x 7/16	Extra .20
3, 3½, 4 and 4½ x ⅝	Extra .30
2½ x ⅝	Extra .40
2½, 3 and 3½ x 5/16	Extra .60
2 x 5/16	Extra .80

Boat Spikes.

¾ in. square, 12 to 24 in. long	Extra .15
⅝ in. square, 8 to 16 in. long	Extra .15
½ in. square, 6 to 16 in. long	Extra .15
7/16 in. square, 6 to 12 in. long	Extra .20
⅜ in. square, 4 to 12 in. long	Extra .30
5/16 in. square, 4 to 8 in. long	Extra .45
¼ in. square, 4 to 8 in. long	Extra .75
¼ in. square, 3 to 3½ in. long	Extra 1.00

⅜ and 5/16 shorter than 4 in., ¼ cent extra.

Merchant Pipe.—Jobbers are placing orders only for such quantities as are needed to maintain a complete assortment of stocks, which are said to be lower than for several years. The total business being booked by the mills is reasonably large, but none of them is running full time. The Wichita Natural Gas Company is inquiring for 20 miles of 6-in., the High Grade Refining Company for 40 miles of 3-in., the Dominion Oil Company for about 20 miles of 8-in., and a Canadian interest is reported to be inquiring for 10 miles of 6 to 8 in., but second-hand pipe may be used. It is stated that discounts on both iron and steel pipe printed on a previous page are being maintained.

Hoops and Bands.—A slightly better demand is noted for both hoops and bands, but it consists mostly of small lots. Several makers state that specifications on contracts are coming in at a better rate than for some time, but none of the mills is yet so pushed as to operate to full capacity. We continue to quote steel hoops at 1.50c. and bands at 1.40c., extras on the latter as per present steel card, but in exceptional cases, and for very desirable orders, slight concessions on these prices might be made.

Boiler Tubes.—All the large consumers of both locomotive and merchant tubes are covered by contracts against which they are specifying, but new buying is light, and mostly in small lots. The recent adjustment in discounts on boiler tubes has put the market on a better basis, and it is said that prices are being more firmly held.

Iron and Steel Scrap.—The scrap market has quieted materially, and prices are weak. Some dealers had chances to sell round tonnages of scrap two or three weeks ago when prices were higher than they are now and refused to do so to their regret. Consumers are pretty well covered and are not willing to take more scrap unless attractive prices are made. We have lowered our prices on nearly all grades of scrap, and unless the demand soon improves still lower prices are likely. In the last day or two prices on cast iron borings and wrought turnings have gone off materially, borings being freely offered as low as $9, and turnings at $10, delivered in the Pittsburgh district. Sales are noted of 500 tons of heavy steel scrap at $14, 500 tons at a shade under this price; 1500 tons of heavy axles turnings at about $11; 1000 tons of cast iron borings at about $9.50; and 1000 tons of wrought turnings at about $10.25. Dealers quote as follows, f.o.b. Pittsburgh, or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.00
No. 1 foundry cast	$14.00 to 14.25
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.00 to 15.25
No. 1 railroad malleable stock	13.00
Grate bars	11.00
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.25 to 24.50
Steel car axles	20.00 to 20.25
Locomotive axles	24.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
*Cast iron borings	9.00 to 9.25
*Machine shop turnings	10.00 to 10.25
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.25
Stove plate	11.00 to 11.25

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—Several quite large inquiries for furnace coke for the last half of the year are in the market, but so far most makers are declining to quote flat prices, not knowing what course the market may take between now and July 1. A good many contracts for furnace coke are now made on a sliding scale, based on the price of basic or Bessemer iron, and some of these that expire June 30 have recently been renewed for the scond half of the year. Prices for prompt shipment are a little better, and we note sales of 16,000 to 17,000 tons of furnace coke for April shipment at $1.65 per net ton at oven. The output of coke in the Upper and Lower Connellsville regions last week was 357,471 tons, an increase over the previous week of over 5000 tons. We quote standard makes of 72-hour foundry coke at $2.10 per net ton at oven to dealers, and from $2.25 to $2.50 to consumers; standard grades of furnace coke for April shipment, $1.60 to $1.65, and for last half $1.85 to $2.

Fletcher Collins, for seven years connected with the office of Naylor & Co., dealers in pig iron and coke, will engage in the same lines on his own account, with offices in the Berger Building, Pittsburgh. For some years he was Pittsburgh agent for the Adrian Furnace Company, and later was connected with the Pittsburgh office of Rogers, Brown & Co., then engaging with Naylor & Co.

The Ohio Iron & Metal Company's new branch office in Cleveland, of which the local manager will be Armand Alexandre, will be in direct charge of the Pittsburgh office

THE IRON AND METAL MARKETS

of the company in the Farmers' Bank Building, and of which H. D. Stalnaker is district manager.

On April 1 the Pittsburgh office of the Cambria Steel Company will be removed from Room 917, Park Building, to Rooms 2424-5-6 in the Oliver Building.

Chicago

FISHER BUILDING, March 22, 1911.—*(By Telegraph.)*

The only activity in pig iron seems to be emanating in small orders from foundries doing work for machinery manufacturers. Prominent in this business are the makers of traction engines, who are enjoying one of the most active periods in their history. The automobile business is also on the increase, as indicated this week by orders for steel going into those channels. Bar iron has strengthened, in contrast to lower prices and a buyer's market on scrap. Structural materials are active and this week's lettings show good totals. The Illinois Steel Company blew in No. 5 blast furnace, at Gary, and No. 7, at South Chicago, March 18. This makes a total of four furnaces in blast at Gary and five at South Chicago. The four furnaces at Joliet are all in operation. A number of sales of open hearth forging billets has been made at $30.60, Chicago, which price had been maintained for some weeks by the leading interest. Liberal orders for track supplies keep mills running to their capacity. With the early spring weather has come magnificent business for all kinds of wire products, which are going to actual consumers, as is indicated by telephone and telegraph orders for prompt shipments. It is the general belief in this market that, regardless of the way the Supreme Court decisions on the trust cases may go, business will improve.

Pig Iron.—The general market is quiet. The principal inquiries are coming from manufacturers of traction engines and automobiles. A Milwaukee manufacturer of plumbers' supplies is reported to have bought 1000 tons of Southern iron for last half delivery. No other recent inquiries of note have been closed in this market. The price of Southern iron remains at $11, Birmingham, for No. 2 foundry for the first half. The following quotations are for March shipment, Chicago delivery:

Lake Superior charcoal	$17.50 to $18.00
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%	19.90 to 20.40

(By Mail.)

Billets.—There is a slight improvement in the sale of billets in this market. The leading interest still maintains the maximum price of $30.60, base, Chicago. The price on open hearth rerolling billets continues to be $25.60, base, Chicago.

Rails and Track Supplies.—A good steady volume of business continues on track supplies, and mills are running full. Approximately 20,000 tons of standard section rail contracts have been received this week by the leading interest, 10,000 tons going to the Great Northern and the balance to numerous small railroads. Contracts approximating 1500 tons of light rails have also been received. Prices are unchanged and firm as follows: We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.30½c., Chicago.

Structural Material.—The demand for structural material has somewhat improved. Building operations are active through the entire West. Contracts let last week include the following: Skagit River bridge, Skagit County, Wash., 333 tons, let to Central States Bridge Company; Washington Portland Cement Company, building frames at Concrete, Wash., 492 tons, to Worden-Allen Company; Oriental Hotel, Dallas, Texas, 1780 tons, to Noelke-Richards Iron Works, Indianapolis, Ind.; coal tipple for Virginia Iron Coal & Coke Company at Toms Creek, Va., 230 tons; Coal Washery for American Coal Company at McComas, W. Va., 130 tons; post-office, North Yakima, Wash., 134 tons, to American Bridge Company; Earle Building, Los Angeles, Cal., 2200 tons, to Llewellyn Iron Works; Chicago, Milwaukee & St. Paul, bridge work, 644 tons, 254 tons to Worden-Allen Company and 390 tons to Milwaukee Bridge Company; Commercial National Bank, Shreveport, La., 490 tons, to Thomas Fordyce, Little Rock, Ark.; American Radiator Company, warehouse, Denver, Colo., 134 tons, to Patterson & Burkhardt, Denver; 150 ft. riveted span for Midland Valley Railroad, 112 tons, to Pennsylvania Steel Company; grillage for Rothschild & Co.'s building, Chicago, 278 tons, to American Bridge Company; Y. W. C. A. building, St. Louis, Mo., 488 tons, general contract let to Selden-Breck Construction Company, reinforced concrete. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The plate business in this market is a trifle halting. Mills are not running to their full capacity, though the prospect of brightening conditions is good. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Specifications against contracts, as well as new business, have somewhat improved this week. Mills have increased their operations to about two-thirds their capacity in order to care for the increase. Prices are well maintained. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—With the recent firming up of bar iron prices mills have increased their output and in some instances are now running five days a week, with good prospects for a continuance. Steel bars are active. Prices are firm, as follows: Soft steel bars, 1.58c.; bar iron, 1.27½c. to 1.32½c.; hard steel bars rolled from old rails, 1.35c. to 1.40c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—The demand for wire products in this market continues very good. Inquiries and specifications are both holding their own with the high record of the past two weeks. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c.; polished staples, 1.98c.; galvanized, 2.28c., all Chicago.

Cast Iron Pipe.—Activity in the pipe business is noted as small municipalities continue to come into the market with the opening of spring. Grand Rapids, Mich., has contracted with the leading interest here for 600 tons of water pipe and Sheridan, Wyo., for 700 tons. Columbus, Ohio, has closed its bids for 1000 tons of water pipe, which will be awarded in the near future. Gas companies have been liberal buyers this week, having closed with the leading interest for a total of about 3000 tons. Routine business is very regular and small orders of 50 to 200 tons each are numerous and furnish the bulk of business at this season. Prices continue firm, as follows, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12 in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—A still further decline in prices is noted this week. Prices have fallen off continually for the past three weeks, and a dealer's opinion that he can neither buy nor sell just about expresses it. The Chicago, Milwaukee & St. Paul has issued a list approximating 1000 tons which closes March 22. The Chicago, Burlington & Quincy is out with a list approximating 3000 tons which closes March 23. The condition of the scrap market is far from parallel with that of bar iron. It is strongly a buyers' market. Prices are for delivery to buyers' works, all freight and transfer charges paid, and are as follows per gross ton:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft.	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.25 to 13.75
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	14.50 to 15.00
Steel angle bars	11.00 to 11.50
Iron car axles	19.00 to 19.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Steel knuckles and couplers	11.00 to 11.50
Locomotive tires, smooth	17.25 to 17.75
Steel axle turnings	8.00 to 8.50
Machine shop turnings	6.75 to 7.25
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	9.75 to 10.25
No. 2 busheling	7.50 to 8.00
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	11.75 to 12.25
Stove plate and light cast scrap	10.00 to 10.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	8.75 to 9.25

THE IRON AND METAL MARKETS

Philadelphia

PHILADELPHIA, PA., March 21, 1911.

Small lot buying characterizes the pig iron market. A little quiet business has been done for third quarter delivery, and consumers would place orders for round lots if producers would be willing to accept forward business. Consumers of low grade iron show the most active interest in the market at this time. In finished materials buying continues fairly active and mills in this territory are, for the most part, operating at an unchanged productive rate. Eastern billet makers still note a lack of interest among usual large buyers. Sheets have been more active. A moderate demand for bars is noted at unchanged prices. Negotiations for round lots of furnace coke are pending. Prices of both furnace and foundry coke are firm. Old materials are duller and prices of some of the leading grades show a decline.

Iron Ore.—Inquiry for low phosphorus ores is reported and negotiations for other grades are under way, but no sales have been reported. Imports at this port during the week ending March 18 aggregated 11,300 tons, valued at $34,829.

Pig Iron.—Transactions, particularly in the foundry grades, have been closely confined to small lots for prompt and near future delivery. In some instances the volume of business of this character is reported to have been quite large, so that the recent large lot movement has not been missed. Other sellers, however, report much quieter conditions as far as the demand for prompt and second quarter iron is concerned. Inquiry for extended delivery is active, but in very few cases will sellers consider business of that character. Some quiet sales for third quarter have been made to regular customers, who, as a rule, do not come openly into the market, and it is stated that such business has been done either at the top of the market or slightly above it. While in quite a few cases $15.75 to $16 is being done for No. 2 X foundry, delivered in this territory, there is still iron of that grade available at $15.50 for prompt and second quarter shipment. The amount of iron available at the inside quotation is reported as gradually becoming smaller. Cast iron pipe makers have taken on several lots of low grade iron, one sale of 1000 tons of eastern Pennsylvania iron for prompt shipment being reported at $15, delivered. One concern, it is understood, is negotiating for a block of 25,000 tons of Southern iron, including Nos. 2, 3 and 4 grades. Both Northern and Southern low grade irons for early delivery are reported as somewhat scarce. The movement in Virginia foundry irons has been less active, but prices are being firmly maintained at the recent level. Inquiries for forge iron for mill purposes continue to come out in moderate quantities, and a scarcity of this grade is believed likely; quotations have advanced on moderate sales, business being done at prices ranging from $14.75 to $15, delivered, and several makers are now quoting $15.25. The demand for steel making iron has quieted down. No further inquiries for basic are reported, and, while $15.25 could probably be done, some makers name $15.50 as their minimum price. Small sales of low phosphorus iron are reported at the recent market. Notwithstanding the decreased demand, prices are very strong, several producers being well sold up for delivery over the remainder of the first half and awaiting developments before quoting for more extended shipment. For near future delivery in buyers' yards in this territory the following range of prices is named for standard brands:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.75 to 15.25
Basic	15.25 to 15.50
Standard low phosphorus	21.50 to 22.00

Ferromanganese.—The market has been somewhat exercised over a reported sale of 5000 tons to a central Pennsylvania steel mill, for delivery from October, 1911, to March, 1912, at a price said to be under $36.75, Baltimore. The general tone of the market is weaker, and while $37.50, Baltimore, is generally quoted for small lots for prompt delivery, $37.25 is understood to have been done for a 500-ton lot for near future shipment.

Billets.—Consumers still place orders in small lots for immediate needs, few being in excess of 100 tons, and show practically no interest in forward business. Mills are anxious for orders, but will make no price concessions. Open hearth rolling billets are quoted at $25.40, delivered in this vicinity, with ordinary forging billets at $30.40, delivered.

Plates.—The volume of business continues on about an even basis, and mills are fully maintaining recent gains in the productive rate. General orders are more numerous and some fair sized business is pending. The Pennsylvania Railroad is reported as negotiating for plates against its programme for building cars, announced earlier in the year. The recent meeting of the steel plate interests had no bearing, it is stated, on the general market situation. Prices are being well maintained at 1.55c. minimum for ordinary plates, delivered in this vicinity.

Structural Material.—Several large propositions under consideration in this district are still held up, although one or more good contracts are expected to be closed this week. Current business consists usually of small prompt lots, together with some small building work. Fabricators continue to name low prices, which are not due, it is said, to lower prices for plain shapes, but rather with the view of obtaining work to maintain their operating forces intact. For plain shapes, delivered in this vicinity, 1.55c. minimum continues to be named.

Sheets.—While the demand is still of the miscellaneous lot class, Eastern mills report a larger number of orders, and in instances are now operating at full capacity. Consumers, however, show little interest in anything beyond requirements for immediate needs, and but a small proportion of forward business is under negotiation. Prices are being fully maintained by Eastern mills, the following range being named for early shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—A moderate and small lot demand continues to come out, and while there is still considerable competition on business with desirable specifications, particularly when the proportion of sizes carrying extras is large, makers in this district are maintaining recent quotations. For refined iron bars prices at Eastern mills range from 1.30c. to 1.35c., with various producers holding firmly at both rates named, which are equivalent to 1.37½c. to 1.45c., delivered in this vicinity. Steel bars are in fair demand, with prices firm at 1.55c., delivered.

Coke.—Considerable business is pending in furnace coke, while consumers of foundry coke show a little more interest in the market in view of placing usual contracts in the near future. Current business has been confined to moderate lots at unchanged prices. Quotations are being firmly maintained, the following range, per net ton, about representing the market for deliveries in buyers' yards in this district:

Connellsville furnace coke	$3.90 to $4.25
Foundry coke	4.40 to 4.65
Mountain furnace coke	3.50 to 3.85
Foundry coke	4.00 to 4.25

Old Material.—Consumers show little interest in the market, and prices in leading grades have undergone a slight decline As the mills are pretty well supplied with various grades of scrap, they have, in a number of cases, reduced offering prices, and sales have been made at the lower levels. No. 1 heavy melting steel has been sold in 1000-ton lots at $14 and $14.25, delivered. Railroad wrought has sold at $17.25, wrought turnings at $10, and cast borings at $9.50, delivered, in each case a decline of 50 cents a ton being noted. Considerable interest is shown in the Government's offering of a cargo of Panama scrap, approximating 1700 tons, at Pier G, Port Richmond, this city, on which bids go in on Wednesday, March 22. The following range of prices is named for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$14.00 to $14.50
Old steel rails, rerolling	15.00 to 15.50
Low phosphorus heavy melting steel scrap	18.00 to 18.50
Old steel axles	21.00 to 21.50
Old iron axles	26.00 to 27.00*
Old iron rails	18.50 to 19.00
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	17.00 to 17.50
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire	12.25 to 12.75
No. 2 light iron	8.00 to 8.50*
Wrought turnings	9.75 to 10.25
Cast borings	9.25 to 9.75
Machinery cast	14.50 to 15.00
Railroad malleable	12.50 to 13.00*
Grate bars	12.00 to 12.50
Stove plate	11.50 to 12.00

* Nominal.

Cleveland

CLEVELAND, OHIO, March 22, 1911.

Iron Ore.—No inquiries are coming from furnace interests and sellers are deferring the consideration of prices until consumers appear ready to buy. Shipments from the docks continue light, showing little improvement over a month ago. Vesselmen are preparing for a late start in ore shipping, and it is probable that many boats operated by companies having connections with ore or furnace interests will not be placed in commission till late in May. We quote prices as follows: Old Range Bessemer, $5; Mesaba Besse-

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mer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The Best Foundry Company, Bedford, Ohio, whose inquiry was noted last week, has purchased through the St. Louis office of the American Stove Company, of which it is a subsidiary concern, 1000 tons of Northern No. 2 foundry iron and 1500 tons of Southern No. 2 for last half delivery. With the Ohio silvery iron contracted for a week ago, this company has bought in all 400 tons for last half delivery. The Northern iron went to a Cleveland furnace at $14.25, at furnace, the buyer having the advantage of a 45c. freight rate, as compared with a 90c. rate from the Valley. For the Southern iron a price of $11, Birmingham, for No. 2, was secured. The market is not active, most other sales reported being in small lots of foundry grades. We note the sale of 800 tons of malleable by a Cleveland agency for last half delivery. A Canton, Ohio, consumer is feeling the market on prices for 3000 tons of basic, which appears very firm at a minimum price of $13.75. There is an inquiry from a Barberton, Ohio, consumer for 6000 tons for the last half, of which 3000 tons is Southern and the remainder foundry, Bessemer and high silicon. We note the sale in northern Ohio of a 500-ton lot and a 300-ton lot of No. 2 Southern for the second quarter. The general asking prices on Southern iron are $11.25 for No. 2 for the third quarter and $11.50 for the fourth quarter. Valley and Cleveland furnace prices are firm at $13.75 to $14 at furnace for No. 2 foundry for the second quarter and $14.25 to $14.50 for the last half. For prompt shipment and the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.50
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	18.00

Coke.—A local furnace interest has closed a contract for 7000 tons of furnace coke per month for the second quarter delivery. There is a moderate demand for small lots of foundry coke, mostly for spot shipment. Prices are firm. We quote standard Connellsville furnace coke at $1.55 to $1.60, per net ton, at oven, for spot shipment; about $1.65 for the second quarter, and $1.75 to $1.90 for the last half. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for the remainder of the year.

Old Material.—There is some demand for small lots of steel scrap, but the market is not active and prices are not firm. The maximum price that local mills are willing to pay for heavy melting steel appears to be $13. Dealers are complaining that some consumers are not taking scrap already bought, but they expect prices to stiffen up again in a short time and are making no attempts to move yard stocks in the present market. The Nickel Plate Railroad receives bids March 22 on about its usual tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	17.00 to 17.50
Steel car axles	19.50 to 20.00
Heavy melting steel	12.75 to 13.00
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	7.00 to 7.50
Iron and steel turnings and drillings	7.50 to 8.00
Steel axle turnings	9.00 to 9.25
No. 1 busheling	11.25 to 11.75
No. 1 railroad wrought	13.00 to 13.25
No. 1 cast	11.75 to 12.25
Stove plate	11.00 to 11.25
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—While no large inquiries are coming out, mill agencies report a good volume of small orders and specifications. Specifications continue to come freely from the implement manufacturers, and bolt makers are ordering quite well. Some of the latter have taken on considerable business in track bolts. Rivet makers are also getting a better volume of orders than for some time. Prices on steel bars, plates and structural material are firm at 1.40c., Pittsburgh. While the demand for plates is not active, there is an improvement in small orders. The demand for structural material is fairly good, considerable tonnage coming out in small lots. A large amount of work requiring round tonnages is in prospect. Bids have been received for the new Technical High School, Cleveland, 330 tons, and the Harper Hospital in Detroit, 300 tons. The Dyer Company, Cleveland, has placed a contract with the Minneapolis Steel & Machinery Company, Minneapolis, for 300 tons for a sugar plant in Elsinore, Utah. The American Bridge Company has taken 110 tons for a bridge for the Detroit United Railways, Detroit, Mich. The demand for sheets is fair and regular prices are being maintained. The demand for iron bars is only moderate; the price of 1.30c. at mill is being generally maintained, although a Western mill has recently shaded this price $2 a ton. Toledo, Ohio, has placed a contract with the United States Cast Iron Pipe & Foundry Company for 1500 tons of pipe for its Water Works Department, mostly 8 and 12 in., at $22.80 a net ton.

The Bassett-Presley Company, Cleveland, Ohio, jobber in iron and steel, will move its offices April 1 from the Western Reserve Building to the Brotherhood of Locomotive Engineers' Building.

Cincinnati

CINCINNATI, OHIO, March 22, 1911.

Pig Iron.—The past few days show a falling off in both inquiries and orders. The actual business booked was much behind the corresponding week in February. An encouraging feature is the movement of contract iron, as consumers are not asking the furnaces to hold up deliveries, but, on the other hand, are generally urging more prompt shipment. No inquiries for large tonnages are coming in, and the majority of those being worked on are from either the Indiana or St. Louis territory with a fair number of requests for prices on small lots from nearby melters. Consumers of Southern iron who are now in the market appear willing to close for last half shipment on a basis of $11, Birmingham, and there are several producers who are taking care of their old customers at this figure for third quarter movement, while it is rumored that a few contracts have been made at the same price extending through the last half. Northern iron is firm at $14, at furnace, for either prompt shipment or for delivery through the third quarter. Several producers are asking $14.50 for shipment after July 1, but they are not booking any business with the exception of a few small orders for special brands. Sales include 500 tons of Southern No. 3 foundry to an Illinois consumer at $11, Birmingham, for last half shipment; two lots of 300 tons each to Michigan manufacturers at $11 for second quarter; 2000 tons of Jackson County silvery, on a basis of $16.50 for 8 per cent. silicon, July-December shipment, to a Northern foundry; two lots of Northern No. 2 foundry aggregating about 1000 tons at $14, April-September, to Illinois users. Malleable is quiet and quoted around $14 to $14.25 for any shipment up to October 1. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75
Southern coke, No. 2 foundry	14.25
Southern coke, No. 3 foundry	13.75
Southern coke, No. 4 foundry	13.50
Southern coke, No. 1 soft	14.75
Southern coke, No. 2 soft	14.25
Southern gray forge	13.00
Ohio silvery, 8 per cent. silicon	17.70
Lake Superior coke, No. 1	15.70
Lake Superior coke, No. 2	15.20
Lake Superior coke, No. 3	14.70
Standard Southern car wheel	25.25
Lake Superior car wheel	19.50

(*By Mail.*)

Coke.—Eastern consumers have inquiries out for furnace coke aggregating about 1000 tons a month. Deliveries are to commence April 1, and the tonnage involved will be divided about equally in contracts for six months' and one year's supply. Connellsville furnace coke is firmer and is now quoted on the same basis as the Wise County and Pocahontas product. In all three fields furnace coke, for spot shipment, is sold around $1.60 to $1.65 per net ton at oven; for the second quarter, $1.65 to $1.75 is asked, and for shipment the remainder of the year, all the way from $1.70 to $2 is quoted, which also represents the figures for 12 months' contracts. Foundry coke is quiet, and only carload lots are being sold. The prompt shipment price is about $2 per net ton at oven, with the usual premium of 25c. per ton asked on future shipment contracts.

Finished Material.—A slight improvement is noted in structural material, and if the inquiries now being figured on all develop into orders, there certainly will be no cause for complaint with either the local jobbers or mill agents. Sheets are better sellers than plates. Hoops and bands are contracted for only moderately well. Railroad track material is not in great demand, and only small orders to fill immediate requirements are reported as placed during the past few days. The mill price of structural material and plates remains at 1.40c., Pittsburgh, and the local warehouse quotations are from 1.85c. to 1.95c.

Old Material.—While there has been a lull in business, prices do not seem to have changed appreciably. The Norfolk & Western and the Southern each sold last week about 5000 tons of scrap, but none of this was taken by local

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dealers. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	5.00 to 5.50
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 11.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Bundled sheet scrap, gross ton	8.50 to 9.00
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	21.50 to 22.50
Old car wheels, gross ton	12.00 to 12.50
Heavy melting steel scrap, gross ton	11.00 to 11.50

St. Louis

ST. LOUIS, MO., March 20, 1911.

An encouraging feature is the marked improvement since March 1 in the demand for all kinds of building material. Leading contractors state that the outlook for activity in building is good. The prospect for railroad buying is better and further sales of standard rails have been made. Sales of cement are very heavy here and at Kansas City, where 400,000 barrels were contracted for last week, of which 50,000 barrels were purchased by the Kansas City Southern Railroad.

Pig Iron.—So far as large inquiries or sales are concerned the market for pig iron was dull the past week, but merchant sellers reported a fair business with small consumers. Large buyers are taking iron due on contracts close up to the time specified. The sale of 1200 tons of No. 2 Northern foundry and 1000 tons of No. 2 Southern foundry to a stove company is reported for shipment over the last half. A leading agency mentions sales to various parties aggregating 800 tons of No. 2 Southern foundry, for shipment over the second and third quarters. Another office reports a sale of 1000 tons of 5 per cent. silicon iron and 500 tons of No. 2 Southern foundry, both for future delivery, and the representative of a leading interest mentions sales of 400 tons of No. 2 Southern foundry. An inquiry is out for 1200 tons of No. 2 Southern soft and 400 tons of No. 2 Southern foundry, both for shipment over the last half; also for 400 tons of ferromanganese for the same delivery. There is some irregularity in Southern prices, but there are sufficient offerings to make the price of No. 2 Southern foundry $11, Birmingham, for shipment over the second and third quarters, and $11.50 for the fourth quarter only. Low grade Southern continues scarce. Northern No. 2 foundry is quoted at $14 to $14.50, Ironton.

Coke.—The market is not as active as it was, but the tone is strong. As far as reported the sales for the past week were quite small in volume, but there are some inquiries covering large tonnages that are said to be pending and likely to be closed within a few days. We quote standard Connellsville 72-hour foundry at $2.15 to $2.25 per net ton, at oven, for shipment over the remainder of the first half, and $2.25 to $2.50 for delivery over the remainder of the year.

Old Material.—Continued dullness in the demand for scrap iron and steel is reported, and the situation has lapsed again into a dealers' market. Prices have eased off and the tone of the market is weaker. The only railroad offerings the past week were the following: Chicago & Alton, 200 tons; Chicago & Eastern Illinois, 400 tons. We quote dealers' prices, per gross ton, f.o.b. St. Louis, as follows:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.00 to 11.50

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

Finished Iron and Steel.—The demand for standard rails is improving, and the leading interest reports closing contracts with five railroads for a tonnage aggregating 70 miles. There is a fair inquiry coming from lumber interests for light rails. The demand for structural material is moderate. For bars there are only scattering inquiries. The demand for track material is steady and fairly good. A sale of 1565 kegs of spikes is reported.

The contract for the erection of the Jefferson Memorial Building, to be erected at the De Baliviere entrance to Forest Park, has been awarded to James Stewart & Co. at their bid of $360,000.

The Miller Coal & Coke Company, St. Louis, has been incorporated. The capital stock is $20,000. The incorporators are Howard E. Miller, Webb T. Miller, W. S. Sands and others.

Birmingham

BIRMINGHAM, ALA., March 20, 1911.

Pig Iron.—Inquiry keeps up very satisfactorily, though nothing large is pending, and the volume of business booked the past week has been relatively light. Shipments on February sales are moving out at a good rate, and it is believed that Alabama stocks on furnace yards will this month show a still further decline. Consumers generally are not believed to have any large accumulations in foundry yards. This is surely true as to the foundries of the South. One of the large interests here announces its schedule of prices on No. 2 foundry basis, Birmingham, at $11 for prompt shipment or for deliveries extending through the second quarter; for the third quarter, $11.25, and for the final quarter of 1911 the price is held firm at $11.50.

Cast Iron Pipe.—The past week has shown little, if any, change. New business appears to have been light, but better prices are undoubtedly being maintained for all the pipe now selling. An inquiry for Los Angeles has had careful consideration, but contracts have not yet been closed on this lot. It is thought that without doubt this business will come to the Birmingham district foundries. No change is recorded in the rate of production, while stocks on foundry yards have been slightly reduced. Manufacturers here report that the following quotations, per net ton, f.o.b. foundries here, correctly represent minimum figures: 4 to 6 in., $22; 8 to 12 in., $20; over 12 in., an average of $19. Gas pipe $1 per ton higher.

Old Material.—Very little has been doing. For some months this line has been a very slow and unprofitable one. Stocks are less and, therefore, quotations are slightly firmer. The future, however, appears to hold no great promise of much better things Quotations remain as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.50 to 13.00
Old steel axles	12.50 to 13.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.50 to 8.00
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.50 to 10.00
Tram car wheels	9.00 to 9.50
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

Buffalo

BUFFALO, N. Y., March 21, 1911.

Pig Iron.—The aggregate of inquiry for the week will total 15,000 to 20,000 tons, principally foundry grades, with some malleable and basic. It is understood that the contract for the 25,000 to 30,000 tons of foundry and malleable for an agricultural implement maker, which was mentioned as under negotiation last week, was taken by a Buffalo furnace, the bulk of it being for first half delivery. In addition to this, orders aggregating a fair tonnage have been taken, comprised of foundry, basic and malleable grades. As a rule, not much active solicitation is being made by producers, as prices obtainable have not yet reached a remunerative point, although there has been a gradual hardening during the past two or three weeks, and most furnaces are holding prices stiffly at the somewhat higher level of the current schedule. Comparatively little business is being taken for delivery beyond the first half, except at an advance. We quote for first half delivery as follows, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.00
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	13.75 to 14.00
Malleable	14.50 to 15.00
Basic	14.50 to 15.00
Charcoal	17.00 to 17.50

Finished Iron and Steel.—A good amount of business is being done in most lines of finished products and prices are firm. The demand for steel bars is a little more active as well as for sheets. The agency of the leading interest has secured the contract for the 250 tons of reinforcing bars re-

THE IRON AND METAL MARKETS

quired for the additional factory building to be erected by the Eastman Kodak Company, Rochester. Considerable inquiry is coming from Canada for track materials for both steam and electric railroads and the Canadian demand is also good in general lines. In fabricated structural work the prospects are bright, with more business in sight than for some months; although much of the work in architects' hands is not yet ready for announcement. Specifications are to be out next week for the structural material for a large foundry plant to be erected here at once.

Old Material.—New buying in scrap has been limited in the past few days, but some small lots have been sold at slightly easier prices than quoted the preceding week. No large offerings are to be had on this easier price basis, however, as scrap from outside points which generally comes to this district is being taken by dealers for shipment to other consuming markets on orders contracted for some time ago for future delivery. Shipments to mills on contracts are moving in good volume. We quote as follows for immediate shipment, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.75 to $14.00
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	15.75 to 16.25
No. 1 railroad and machinery cast scrap	14.75 to 15.25
Old steel axles	20.00 to 20.50
Old iron axles	24.00 to 25.00
Old car wheels	14.75 to 15.00
Railroad malleable	14.00 to 14.25
Boiler plate	11.75 to 12.00
Locomotive grate bars	11.75 to 12.25
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	7.50 to 8.00
Clean cast borings	7.00 to 7.25

The German Iron Market

An Open Market on Steel Bars

BERLIN, March 10, 1911.

The adjourned meeting of the steel bar manufacturers, which was held several days ago, had the result foreshadowed in this correspondence. The price convention was not renewed, and all the other points agreed upon in a preliminary way have also been dropped. The failure to reach an agreement was due to the refusal of the Hoesch Company to have prices fixed; the other companies regarded it impossible to carry out a combination successfully which did not include that great interest. It is generally conceded that this failure to reach an agreement will prove final—for this year, at any rate. As to the future tendency of bar prices, it is asserted in some quarters that the figures will not go much lower than now, if any; but this is probably a too optimistic view of the matter, even assuming present prices to be about 105 to 107 marks for the home market. It is also rather difficult to say what is the state of business in the bar trade. Some reports assert that business has been practically at a standstill during the negotiations for the combination, but others assert with equal positiveness that orders have been arriving in pretty good volume all along, and from this it is argued that there is really a big demand still to be satisfied. Since the breakdown of the negotiations no news has reached Berlin indicating that buying has grown more active.

Increased Activity in Beams

This week the Steel Works Union has voted business open in structural shapes for the June quarter at unchanged prices. There had been a considerably increased activity in beams, consumers having feared that prices would be raised, and in this way the mills have more work on hand than last month. There are, however, still no indications that the building trade will have the expected strong revival this spring; hence it is doubtful whether the business in structural shapes will reach a satisfactory volume. Orders for semimanufactured steel are fairly good, consumers having begun to contract for their next quarter's requirements since the Union opened business in this specialty a fortnight ago. A good export demand is reported; England in particular is trying to place orders pretty far ahead, but German mills usually succeed in obtaining price advances in such cases. The outlook for the rail business is better. There will be heavier domestic orders, and the foreign market continues to take heavy rails in good quantities. The home demand for light rails is also looking up, and the business in grooved rails remains quite good, both home and foreign buyers taking a hand. The shipments of the Union in semimanufactured material, structural shapes and rails in February amounted to about 417,000 metric tons, as compared with 404,000 in January. The gain was wholly in structural shapes.

Heavy plates have grown more active. The foreign market is especially showing a big demand. Home construction shops are sending in good orders, and the shipbuilding industry is increasing its takings. Business is also good in medium plates, and a moderate improvement in thinner qualities is mentioned. Orders for wire rods are coming in better since the price question was settled a few weeks ago, but there is no urgency in the demand. The foreign demand is steady. The mills are pretty well supplied with orders, and in some cases higher prices are demanded and allowed.

Pig Iron Quiet

The pig iron market continues quiet. New ordering is of light volume. Scrap is coming on the market in larger volume, but prices are held pretty firmly, there being a good demand. The production of pig in February was 1,179,100 metric tons, with a gain of 87,858 tons over February, 1910; whereas January had gained 143,100 tons over the corresponding month of 1910. The ore trade is active, but there is little ordering for home ores, as arrangements had already been made far ahead. The imports of ores in February showed a big gain—729,600 tons, against 184,400 tons in February, 1910. The heavy movement was largely a reaction from the light imports in January.

The good reports from the Belgian market continue. Another advance of about 2 shillings a ton for plates of all qualities for export is mentioned. From the Luxemburg-Lorraine district the pig iron trade is reported as very quiet. Production is increasing there rapidly and a number of new furnaces are coming into blast soon. From that district comes the news that another consolidation is about to be carried out. The Burbacher Hütte, the Düdelingen Eisenhüttenverein and the Eicher Hüttenverein are to be amalgamated into a powerful combination. The new concern will own 22 blast furnaces, a number of basic and open hearth steel works and an electrical furnace plant at Eich. The new company will also own very extensive ore properties. The amount of its capital has not yet been mentioned, but it will probably reach $12,000,000 to $15,000,000.

The stock market to-day was considerably encouraged by the half yearly report of the Laura Hütte, the most important concern of the Silesian district. It showed earnings for the past half year of $785,000, as against $635,000 for the second half of 1909.

According to a Vienna dispatch of yesterday the general manager of the Prager Eisenindustrie Gesellschaft stated in the annual meeting that a conference would be held at Brussels in July of the iron interests of all exporting countries, for the purpose of trying to arrange an understanding in regard to the export trade and markets.

New York

NEW YORK, March 22, 1911.

Pig Iron.—The market is quiet, but firm—more so, apparently, than the foundry iron market in Central Western districts. Several New Jersey foundries have been buyers in the past week, but only an occasional transaction is reported above 1000 tons. On the whole there is less activity in the past two weeks. Foundries are generally covered for the second quarter, and are waiting for more definite developments as to the second half. Eastern Pennsylvania and New Jersey furnaces are holding quite firmly for advances for the last half, and the indications are that the market will drift for a little time. We quote tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.50 to $16; No. 2, $15 to $15.25.

Steel Rails.—The Illinois Steel Company's sales in the past week amounted to 20,000 tons, of which 10,000 tons went to the Great Northern, 1800 tons to the Interurban Construction Company, 2200 tons to the Interurban Traction Company, and 2600 tons to the Illinois Contracting Company. The Pittsburgh Railways are in the market for 1700 tons of girder rails and the Chicago City Railways for 4000 tons. The Boston Elevated is inquiring for 600 tons of 85-lb. rails.

Ferroalloys.—A sale of 5000 tons of ferromanganese was made in the New York market for a western Pennsylvania steel company for delivery over the last quarter of this year and the first quarter of next year at a price less than $36.90, Baltimore. It is hardly probable that ferromanganese could be bought in this market at present, however, at less than $37, Baltimore, as several small lots sold during the week brought that price. Ferrosilicon is in little demand, and it can be had at about $55, Pittsburgh.

Finished Iron and Steel.—In the past two weeks several of the long held-up building contracts have been placed. The release of the considerable tonnage involved directly benefits only the successful bidders, but indirectly it will have a stimulating influence on all finished lines by encouraging the placing of the remaining deferred contracts and decreasing the tendency to delay on new matters that are still to come into the market. In the past week the plate business in this territory has not been up to the preceding week, but it represents only a normal fluctuation and does

THE IRON AND METAL MARKETS

not impair confidence in good spring prospects. Steel bars show little change, but bar iron orders were a little better last week than the week before and prices are well maintained. The principal large structural contracts released during the week were for the post-office at the Pennsylvania Railroad terminal, 6400 tons, and the Masonic Temple, 3700 tons, both of which have gone to Post & McCord, and the Curtis Publishing Company's storage warehouse, Philadelphia, the steel for which, 4000 to 5000 tons, has been awarded the American Bridge Company by the general contractors, Wells Brothers. The American Bridge Company also has 1700 tons for an express building in Jersey City for the Central Railroad of New Jersey and about 800 tons for a pier for the same road at about Fortieth street on the New York side of the Hudson River. Other structural awards were as follows: To Levering & Garrigues, 1800 tons for the Lewis & Conger store, Forty-sixth street and Sixth avenue, New York City; to Ravitch Brothers, 500 tons for the Felt Construction Company's loft on West Twenty-ninth street, and 600 tons for the Dominick Abbati loft, 237-9 Lafayette street, New York City; to the Hay Foundry & Iron Works, 850 tons for the Communipaw pier sheds for the Central Railroad of New Jersey; to the Virginia Bridge Company, 700 tons for the Oxnard Company's sugar refinery at Adeline, La., and to the Buffalo Structural Company, 160 tons for the Hower building at Akron, Ohio. Bids closed Monday on a printing house, 2500 tons, to be built by the Trinity Corporation at Hudson and Delancey streets, New York, and 1500 tons of bridge material for the Western division of the Grand Trunk Railway. Bids go in to-day on 1600 tons for a bridge for the Lehigh & New England Railroad at Bethlehem, Pa. Bids are now being received on 900 tons for a grand stand on the Fair Grounds at Allentown, Pa., and 700 to 800 tons for the Leh building in the same city, and on 250 tons for a pier shed for the New York Dock Company in Brooklyn. The New York Central is in the market for a bridge of about 75 tons at Troy, N. Y., and the Delaware & Hudson for one of about 50 tons at Plattsburgh, N. Y. The American Building Company is reported to be about to come into the market for a large tonnage of steel for a number of warehouses to be erected in Boston. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.40c. to 1.45c., all New York. Store prices for plain material and plates, New York, are 1.85c. to 1.95c.

Cast Iron Pipe.—The city of Pittsfield, Mass., will open bids March 27 on 3800 tons of water pipe. It is expected that the New York Department of Water Supply, Gas and Electricity will shortly ask for bids on 7000 to 10,000 tons of 48-in. pipe for delivery in the Borough of the Bronx. The United States Government opened bids last Thursday on 700 tons of bell and spigot pipe and 200 tons of flange pipe for shipment to the Philippine Islands. The lowest bid on the bell and spigot pipe was $20.90, New York, by the Standard Cast Iron Pipe and Foundry Company, and $31.20 on the flange pipe, by R. D. Wood & Co. The demand from private water and gas companies is keeping up quite well. Carload lots of 6 in. are quoted at $21 to $22 per net ton, tidewater.

Old Material.—The market is moderately active in heavy melting steel scrap. The steel companies are only purchasing small quantities, but dealers are buying to a somewhat greater extent for shipment on contracts. The rolling mills are doing very little, and dealers are having an exceedingly trying experience in endeavoring to make shipments which will not be open to rejections on comparatively slight pretexts. Cast scrap is in fair demand, and some pressure is noted for shipments of cast borings on contracts. The outlook generally is not very promising and dealers are looking for lower prices. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$11.25 to $11.75
Rerolling rails	12.50 to 13.00
Heavy melting steel scrap	11.25 to 11.75
Relaying rails	20.50 to 21.00
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	7.00 to 7.50
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	10.00 to 10.50
Malleable cast	11.50 to 12.00

The first battery of 55 Koppers by-product coke ovens at the plant of the Lake Superior Corporation, Sault Ste. Marie, Mich., is completed, and the first coke was made March 11. A total of 110 ovens will be built at this plant.

Metal Market

NEW YORK, March 22, 1911.

THE WEEK'S PRICES

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
March.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
16	12.50	12.25	39.00	4.37½	4.22½	5.65	5.50
17	12.50	12.25	39.35	4.37½	4.22½	5.65	5.50
18	12.40	12.17½	....	4.40	4.25	5.65	5.50
20	12.45	12.20	39.90	4.40	4.25	5.65	5.50
21	12.50	12.25	40.87½	4.40	4.25	5.65	5.50
22	12.50	12.25	40.50	4.40	4.25	5.65	5.50

Tin maintains its high price, but premiums on spot are lower. Copper sagged during the week but is now firmer. The nominal price for spelter is unchanged, but there are reports of price cutting. Buyers are taking more interest in lead, and the market is stronger.

Copper.—Good sales of both lake and electrolytic copper were made during the week at slightly lower prices than were in effect seven days ago. The market is stronger to-day than yesterday, with resultant stiffening in quotations. While there have been reports of unusually large sales of copper for export, it is generally believed that they were more talk than fact. Sales of good round lots of electrolytic copper have been made both for domestic consumption and export. Sellers who have made concessions to obtain good orders are reluctant to state how much metal they have disposed of and the result of their transactions will probably not be known for several weeks, when their sales to foreign accounts will be shown in the exports. It is certain that considerable electrolytic copper was disposed of at around 12.17½c. on Saturday and Monday, and lake copper was offered by some sellers at 12.40c. on those days. The apparent anxiety to sell by some holders unsettled the market, and quotations were irregular and in some cases they were split one-half point in order to induce consumers to buy. Electrolytic copper to-day is fairly firm at 12.25c., and lake is held at 12.50c. The exports of copper so far this month have been 13,821 tons. The London market closed quiet to-day with spot copper bringing £55 and futures selling at £55 11s. 3d. The sales amounted to 150 tons of spot and 600 tons of futures.

Pig Tin.—Consumers are still at the mercy of the London syndicate. Notwithstanding the fact that arrivals in this country have been unusually heavy so far this month, the spot supply is scarce. In all 4437 tons of pig tin have come into American ports during the month and most has gone into the hands of consumers. These deliveries have satisfied the demand to some extent, and consequently premiums on spot are much lower. During the week they ranged from ⅛c. to ¼c. per pound over the London market. There are 2680 tons of tin afloat, but much of it will not arrive here until after the end of the month. Little buying has been done, as most of the tin arriving at this port was contracted for weeks ago. In New York to-day pig tin was sold for 40.50c. The London market closed weak, with spot tin selling at £182 15s. and futures at £182 5s. The sales amounted to 70 tons of spot and 570 tons of futures.

Tin Plates.—A good, steady demand exists, but there is a dearth of large inquiries, most of the buying being in small lots. Quotations on 100-lb. coke plates remain at $3.94, New York. The price of foreign tin plates is still prohibitive to many who buy for re-export, and it is hard to get early deliveries, as the mills in Great Britain have more business than they can handle. The quotation for tin plates at Swansea, Wales, to-day was 14s. 7½d.

Lead.—The lead market is stronger and some good business has been done, especially in St. Louis. The leading interest seems firm in its intention to keep its quotation at 4.50c. and outside sellers have advanced their price to 4.40c., New York. The price in St. Louis is now 4.25c., and in view of the increasing demand the market may go higher.

Spelter.—The spelter situation is hard to define. Consumers are taking so little interest in the market that prices are largely nominal, but it is generally believed that some sellers have been making concessions to induce business. The usual quotations are 5.50c., St. Louis, and 5.65c., New York, but it might be possible for consumers to get better prices than these.

Antimony.—Antimony is dull and easy. It appears that this time the ultimate consumer, as a whole, has not lost anything through the decline in prices, as most of the recent trading has been between dealers, consumers having apparently been well stocked before the announcement of the formation of the antimony syndicate. Cookson's is nominally 9.50c.; Hallett's, 9.12½c.; Hungarian and Chinese grades, 8.60c. Dealers are asking 9.25c. for Hallett's for delivery during June and July, while Hungarian and Chinese grades can be had for delivery during those months at 8.35c.

THE IRON AND METAL MARKETS

Old Metals.—The market holds up well. Selling quotations are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	11.75 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Clean brass turnings	7.75 to 8.00
Composition turnings	8.75 to 9.00
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.25 to 4.30

Metals, Chicago, March 21.—The market for metals is somewhat improved, although prices have not strengthened very perceptibly. There is some shading on the price of lead. The market for old metals continues very quiet. We quote Chicago prices as follows: Casting copper, 12⅝c. to 12¾c.; lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41½c.; small lots, 43½c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c. to 5.55c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅜c.; zinc, 4¼c.; pewter, No. 1, 29c.; tin foil, 32c.; block tin pipe, 35c.

Metals, St. Louis, March 20.—Lead is quiet at 4.22½c.; spelter dull, but firm, at 5.45c., both at East St. Louis. Zinc ore is in very large supply and quiet at $38 to $40 per ton, Joplin base. Tin is easier at 40.15c.; antimony (Cookson's) unchanged at 9.85c.; lake copper easier at 12.85c.; electrolytic, 12.60c., all at St. Louis. The demand for finished metals the past week was quieter.

Iron and Industrial Stocks

NEW YORK, March 22, 1911.

The stock market has been surprisingly strong in view of somewhat unfavorable conditions now existing as well as the very moderate volume of transactions. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com	8	Pressed St., pref	97½
Allis-Chalm., pref.	31 - 32½	Railway Spr., com.	34 - 34¾
Beth. Steel, com.	31½ - 32¾	Railway Spr., pref.	98 - 98½
Beth. Steel, pref.	61 - 61⅞	Republic, com	33⅝ - 34¼
Can. com	9½ - 9⅞	Republic, pref.	97¼ - *98
Can. pref.	80⅛ - *80⅝	Sloss, com	52¼ - 53½
Car & Fdry, com.	53 - 54¼	Sloss, pref.	112
Steel Foundries	47⅛ - 48	Pipe, com.	17¾
Colorado Fuel	32½ - 33⅜	Pipe, pref.	58
General Electric	149½ - 150¼	U. S. Steel, com.	77⅛ - 79⅜
Gr. N. ore cert.	58¾ - 61⅜	U. S. Steel, pref.	118½ - 119½
Int. Harv., com.	116¾ - 118½	Westinghouse Elec.	66¾ - 68½
Int. Harv., pref.	123 - 124¼	Va. I., C. & C.	60 - 61
Int. Pump, com.	41 - 41½	Am. Ship, com.	75 - 75¾
Int. Pump, pref.	89 - 89¾	Am. Ship, pref.	112½ - 112⅞
Lackawanna Steel	44	Chi. Pneu. Tool	50½ - 51⅝
Locomotive, com.	38¾ - 39½	Cambria Steel	47½ - 48½
Locomotive, pref.	109¼	Lake Sup. Corp.	29½ - 31¼
Nat. En. & St., com.	17⅛ - 18	Crucible St., com.	13⅜ - 13¾
Nat. En. & St., pref.	88⅝	Crucible St., pref.	80 - 81⅞
Pressed St., com.	33 - 33½		

* Ex dividend.

The Otis Elevator Company has issued its report for the year ended December 31, 1910, which shows net earnings, after deducting all charges for interest and patent expenses and for renewals and repairs, of $1,157,371, against $1,048,689 in 1909. The surplus, after payment of dividends on the preferred and common stock, was $130,125, against $115,985 in 1909. The balance sheet shows a surplus of $2,130,535 December 31, 1910, against $2,000,410 at the end of the previous year. The report states that special attention was given last year to the further extension and development of the company's business in Europe and South America. The Canadian subsidiary, operating shops in Hamilton, Ont., is showing satisfactory results. The outlook for business in 1911 is not in some respects as favorable as it was last year, although the contracts closed up to this time indicate that there will be a fair demand for the company's product.

Dividends.—The Yale & Towne Mfg. Company has declared the regular quarterly dividend of 1½ per cent. and an extra of 1 per cent., payable to stock of record March 28.

The Union Switch & Signal Company has declared the regular quarterly dividends of 3 per cent. on the common and 3 per cent. on the preferred stock, payable April 10.

The Dominion Iron & Steel Company, Ltd., has declared the semiannual dividend of 3½ per cent. on the preferred stock, payable April 1.

The American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 21.

Manning, Maxwell & Moore, Inc., have declared the regular quarterly dividend of 1½ per cent., payable March 31.

The E. W. Bliss Company has declared the regular quarterly dividends of 2½ per cent. on the common and 2 per cent. on the preferred stocks, payable April 1.

The Walworth Mfg. Company has declared the regular quarterly dividend of 3 per cent., payable March 31.

Notes on Prices

Rope.—Some manufacturers report an improvement in demand, especially on the best grades of Manila rope, while sisal rope shows less activity. Manila fiber has advanced slightly in price, as has also sisal fiber, but with the moderate demand for the finished product regular quotations have not been affected. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8½c. to 9c. per pound; second grade Manila, 7½c. to 8c. per pound; hardware grade, 7c. to 7½c. per pound; pure sisal of the highest grade, 6½c. per pound; second grade, 6c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6¼c. per pound.

Linseed Oil.—While oil is procurable in carload lots at a little under former prices, the inducement does not appear attractive to buyers. The following quotations represent New York prices in 5-barrel lots or more:

	Cents.
State, raw	95
City, raw	95

Oil in lots of less than 5 bbls., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon over raw.

Naval Stores.—Turpentine has made a sharp advance at this point, following higher prices at Savannah, where receipts are being taken freely. There is some fear that the new crop will be late, as a result of cold weather in the turpentine belt. New York turpentine quotations in 5-barrel lots are as follows:

In oil barrels	$1.05½
In machine barrels	1.06

Less than 5-bbl. lots, ½ cent advance per gallon.

Rosins are quiet but higher in price, owing to advances in the Southern markets. On the basis of 280 lb. to the barrel, common to good strained is quoted at $8, and grade D at $8.55 in the New York market.

The Standard Chain Company, on Tuesday, lost its entire Schmidt plant at York, Pa., by fire, causing a loss of $35,000 to $40,000, fully covered by insurance. There will be no interruption whatever in the filling of orders, as all contracts originally intended to be filled at that plant will be transferred to other works of the company and will be shipped out promptly. The Schmidt plant will be rebuilt as soon as possible and probably on a larger scale than before.

The Link-Belt Company states that its sales office formerly located at 84 State street, Boston, Mass., has been moved to more commodious quarters at 131 State street, Boston, to take care properly of the increasing demand for Link-Belt elevating, conveying and power transmission machinery and chains. Lawrence Spillan is in charge.

The Best Mfg. Company, Pittsburgh, has secured the contract for the piping (water, steam and oil), with valves and fittings for the new blast furnace plant being built at South Buffalo, N. Y., by the Rogers-Brown Iron Company. This contract involves a large amount of material.

The Sweet's Steel Company, Williamsport, Pa., states that its capital stock has been increased from $200,000 to $600,000. This increase has been effected for the purpose of making additions and improvements to the plant, and to furnish the capital necessary for steadily expanding business.

The Carbon Iron & Steel Company, Ltd., Parryville, Pa., will blow out its blast furnace about May 1, for needed repairs. In addition to relining the furnace, the stoves will be relined and some additions made to the boiler plant.

Open Hearth Furnaces with Magnesite End Blocks

An interesting statement is made by the Blair Engineering Company, 21 Park Row, New York, comparing the outputs of two open hearth furnaces, known as Nos. 1 and 3, in the same plant and having the same capacity. They were rebuilt and started at the same time, July 1, 1910. Furnace No. 1 was equipped with Blair ports, and No. 3 furnace had silica brick ports. Furnace No. 3 was out for general repairs twice in the eight months and at the time of the second repair was equipped with Blair ports. The comparison is as follows:

	No. 1. Tons.		No. 3. Tons.
July, 1910	2,972		2,906
August, 1910	2,999		2,496
September, 1910	2,828	($5,000 repair)	1,062
October, 1910	2,880		2,860
November, 1910	2,967		2,831
December, 1910 (Air checkers repair, $500)	2,530	($6,000 repair)	1,968
January, 1911	2,950		1,767
February, 1911	2,927		2,907
Totals	23,053		18,797

New York City's Largest Steel Girder.—The record made on March 5, when a 60-ton steel girder for the new Municipal Building was carted through the streets of New York City has been broken. On Sunday last, two still heavier girders were transported from the pier at the foot of West Forty-third street to Fifth avenue and Thirty-eighth street, where they will form the lintel over what is to be one of the largest show windows in the city. The girders weighed approximately 68¾ tons, and in moving each 46 horses were used. In hauling the truck two long steel cables were employed, 11 teams being hitched to each. For guiding the truck the two wheel horses were hitched in a double pair of shafts. After each trip it was necessary to replace a number of broken manhole covers.

The J. B. & J. M. Cornell Company's proceeds promise little for unsecured creditors. The bids received March 20 by Trustee A. Gordon Murray comprised four for some part of the assets and one for the entire property, which was made by the New York Trust Company, Sarah K. Cornell, Jones & Laughlin Steel Company, Phœnix Iron Company and Lukens Iron & Steel Company, representing bondholders and a few of the large creditors. They propose to form a new company to take over the assets and carry on the business, issuing certificates of indebtedness for the obligations incurred by the receivers. Bondholders are to receive 10 per cent. in stock of the new company, and the capital stock of which is to be put in a voting trust pending the payment of the receiver's obligations. The United States District Court will pass on the bids March 27.

The new railroad bridge for the transfer of hot metal from the Heckscher furnaces at Swedeland to the steel works of the Alan Wood Iron & Steel Company, at Ivy Rock, Pa., will be completed in a few days. The bridge is 887 ft. in length and crosses the Schuylkill River, the Pennsylvania Railroad and the Philadelphia & Reading Railroad. It was designed and built under the supervision of Frank C. Roberts & Co., engineers, Philadelphia. Several weeks will elapse before the actual transfer of hot metal will be begun, as there still remains some work to be done before the Alan Wood Company will be prepared to use the hot metal in its steel making furnaces.

The McMinn & Quigley Steel Company, Boston, Mass., dealer in tool steels, has taken the store at 259 Atlantic avenue, where a complete stock will be carried. The company has already moved from its offices in the Mason Building. The business was recently changed from a copartnership to a Massachusetts corporation, with Harry F. McMinn as president, and H. T. Quigley, treasurer. The company represents the John Illingworth Steel Company, the Griffin Mfg. Company's line of cold rolled strip steel, and the Bleekmann-Phenix Steel Works, Styria, Austria, the last being a recently formed connection.

The Asa W. Whitney Car Wheels

The Enterprise Foundry & Machine Works, Bristol, Tenn., is making unusually excellent chilled car wheels under the direction of its metallurgist, Asa W. Whitney, whose experience began in 1884 with A. W. Whitney & Sons, Philadelphia. The process by which these wheels are made has been developed by Mr. Whitney, who claims that his method of close regulation of the microstructure of metal by careful chemical calculation of the cupola mixture, by his improved form of contracting chill ring, and by his original method of rapid annealing makes a better wheel at less cost than heretofore. The Bristol *Herald-Courier* reports an excellent performance of a set of eight standard M. C. B. 33-in. Whitney wheels. These have run about 34,000 miles in six months, under a heavy switching engine, which makes about 180 to 200 miles per day, and are evidently good for more than the maximum service ever rendered under this engine by other standard makes of chilled wheels, and probably will give 120,000 miles where others failed at 40,000.

The Western Brass Mfg. Works, Campbell avenue and West Twenty-first street, Chicago, is now erecting at 2007 to 2011 Marshall boulevard a strictly modern foundry building which is expected to be completed at an early date. This will give the company much more space and will enable it to meet any demand that may be made on its facilities and resources. The company claims that it now has the largest and best brass foundry in Chicago. It was established in 1876 and incorporated in 1891. It manufactures standard and special hardware and auto accessories in brass, bronze, aluminum and iron. Joseph Hadka is president.

The American Sheet & Tin Plate Company's plant at Elwood, Ind., has been obliged to lay off temporarily 6 of the 26 hot mills, owing to the congested condition of the tin house, which has not been able to care for the output of the hot mill department since the limit was removed and workmen are permitted to turn out all the product the mills can handle. Ten new tin stacks are to be added to the finishing department. The largest month's business ever done by the Elwood plant was reported for February, although there were only 26 working days.

The Richardson-Phenix Company, manufacturer of oiling devices, Milwaukee, Wis., has opened a branch office in the Keystone Building, 324 Fourth avenue, Pittsburgh, Pa. This office will be under the management of H. M. Laughlin, who has been with the company for several years.

The Browning Foundry Company, Ravenna, Ohio, will shortly begin the erection of a new power house and new pattern shop. This company has also acquired a site for a new steel foundry, but states that it has not yet decided whether to build the foundry during the present year.

Wickwire Brothers, Cortland, N. Y., have completed arrangements for the installation at their wire manufacturing plant of two large gas producers, with coal hoist, two 500 hp. gas engines and two large dynamos to replace the present 800 hp. steam engine.

The Casey & Hedges Company, Chattanooga, Tenn., well- known manufacturer of boilers and plumbing specialties, has closed its Cincinnati office. T. R. McDonnell, manager, was transferred to the New Orleans office, of which he had charge before going to Cincinnati.

The Princess Furnace Company blew in its blast furnace at Glen Wilton, Va., March 17.

Personal

Charles T. Root, president of the David Williams Company, has sailed from San Francisco for Japan. He will spend some time in that interesting country, and may extend his trip to China and Manila. He expects to be absent three months.

R. N. Palmer has resigned as instructor in foundry practice at the Worcester Polytechnic Institute, Worcester, Mass., to become foundry superintendent of the Buckeye Engine Company, Salem, O.

Earle R. Knight has been appointed superintendent of the Bullock Electric Mfg. Company, Norwood-Cincinnati, O., to succeed T. L. Loose, who resigned to accept the superintendency of a manufacturing plant in Toledo, O.

R. R. Freer, who has installed many cost accounting systems for machine shops in the Central West for Miller, Franklin & Stevenson, Boston, Mass., has severed his connection with that firm, and in future will conduct a similar business of his own. His headquarters will be in Norwood, O., a Cincinnati suburb.

A. B. Sanders announces that he has severed his connection with John B. Watson as manager of his electrical department, and has established a similar business in electric railway equipment under the style of A. B. Sanders & Co., Witherspoon Building, Philadelphia, Pa.

James L. Ferguson, manager of the Milwaukee office of Joseph T. Ryerson & Son, Chicago, and more recently general manager of the Joliet Rolling Mills Company, Joliet, Ill., has resigned the latter connection to accept a position at Buffalo, with the Lackawanna Bridge Company.

The Herman Pneumatic Machine Company, Zelienople, Pa., desires to correct the statement in our last issue that Carl Falk, who recently left that company, was its sales manager. The company states that he was merely an employee.

An address on gas engines was given before the Cleveland Shop Superintendents and Foremen's Club March 18 by R. R. Stewart, mechanical engineer Tygard Engine Company, Pittsburgh, Pa.

Franklin T. Reese, for some years connected with the engineering department of the Westinghouse Air Brake Company, Wilmerding, Pa., and well known in mechanical engineering and railroad circles, is now general sales manager of the Vanadium Mines Company, with headquarters in the Frick Annex Building, Pittsburgh.

Adolph F. Ellfeldt, president and treasurer of the Ellfeldt Hardware & Machinists' Supply Company, Kansas City, Mo., expects to visit Germany, his old home, and other parts of Europe during May, June and July. He will be accompanied by his son Howard.

J. W. Gardner, president of the Gardner Governor Company, Quincy, Ill., will sail shortly for Europe accompanied by his wife and son.

Clinton H. Scovell of Clinton H. Scovell & Co., whose offices are at 110 State street, Boston, and 90 West street, New York, has been appointed by Governor Foss of Massachusetts as one of three experts to investigate the departments, commissions and institutions of that State. Mr. Scovell's investigations will relate particularly to public works and buildings, public utilities and the natural resources of the State.

The Crocker-Wheeler Company, Ampere, N. J., has appointed Clarence E. Delafield district manager, with headquarters at its offices in the Boston Safe Deposit and Trust Building, 201 Devonshire street, Boston, Mass., succeeding R. N. C. Barnes, resigned.

W. L. Schellenbach, chief engineer Lodge & Shipley Machine Tool Company, delivered an interesting address on the evening of March 17 to the students of the manual training department of the Hughes High School, Cincinnati. The address dealt with the early establishment of manufacturing industries in Cincinnati and the importance attained by them at the present time.

Prof. W. F. Schaphorst of the mechanical engineering department of the New Mexico College of Mechanic Arts has resigned his position there to become a technical writer on the staff of A. Eugene Michel, advertising engineer, New York City.

J. Raymond Young, formerly with the sales department of the Buffalo office of the Carnegie Steel Company, is now representing that company's Pittsburgh warehouse at Charleston, W. Va. He has been succeeded in the Buffalo district by Robert G. Lea, formerly with the same company at Pittsburgh.

On April 1 Will McLain, who has been connected with the Cambria Steel Company, Johnstown, Pa., for 20 years, will resign the active duties of sales agent in the Pittsburgh territory, to be succeeded by his son, J. E. McLain, but will remain with the Pittsburgh office of the company and continue to serve his many friends.

J. W. Deetrick, formerly superintendent of the Youngstown plants of the Republic Iron & Steel Company, embracing blast furnaces, steel works and rolling mills, has been appointed manager of the entire operating department of the company for all its plants, succeeding to the duties formerly performed by T. J. Bray, who has been made president.

A Story of the Freight Rate Hearing.—A pamphlet of 47 pages has been prepared by Frank W. Noxon, secretary of the Railway Business Association, under the title "The Rate Decision and Railway Credit." It is Bulletin No. 6 of that association and is a graphic narrative of the hearings on the freight rate cases. Mr. Noxon attended most of the hearings and had access to all the stenographic reports so that his story is comprehensive and authoritative. He says that the object of the Railway Business Association in publishing his sketch is to "lend a hand in lubricating with friendliness that friction which generates heat and enervates judgment." Though the association was organized for the promotion of good will between the railroads and the public and is avowedly friendly to the railroads, the pamphlet expresses no opinion as to the wisdom or unwisdom of the decision of the commission. Naturally, in presenting the testimony, it puts more emphasis upon the developments favorable to the contention of the railroads than appears in publications designed to emphasize the need for greater efficiency in railroad management.

Cleveland Superintendents and Foremen.—The annual meeting of the Cleveland Shop Superintendents' and Foremen's Club was held March 18. Reports indicated that the club is in a flourishing condition. Its membership has now reached about 200. Officers for the ensuing year were elected as follows: President, B. S. Blosson, Foote-Burt Company; vice-president, John Mortimer, Central Brass Mfg. Company; treasurer, Fred Seberlin, P. A. Geier Company; sergeant-at-arms, Charles Schock, W. M. Pattison Supply Company; executive committee, J. H. White, Baker Motor Vehicle Company; L. W. Dosley, Cleveland Hardware Company; B. D. Fuller, Westinghouse Electric & Mfg. Company; J. H. Francis, Kilby Mfg. Company; membership committee, Joseph Burrows, American Railway Signal Company; John Tiplady, Variety Iron & Steel Works Company; Adam Herkner, Warner & Swasey Company; D. L. Larimer and J. G. Walt, Cleveland Punch & Shear Works Company. The club will hold a banquet some time in April.

The Atlas Steel Casting Company has been incorporated at Buffalo, under the laws of the State of New York, with a capital stock of $100,000, and will build a modern fireproof foundry of concrete and steel for the manufacture of steel castings by the acid open hearth process. A site for the plant has been selected, and construction will be commenced at once. The plant will be equipped with electric cranes and monorails and all up to date facilities for the handling of raw materials and finished products. The officers and directors are: George H. Chisholm, president; E. C. Strong, vice-president and general manager; Frederick C. Gratwick, Newcomb Carlton and Wm. A. McMahon. Temporary offices have been established at 410 Prudential Building. Mr. Strong, the vice-president and general manager, was formerly general manager of the Strong Steel Foundry Company, Buffalo.

The United States Steel Corporation's 1910 Report

Gross Receipts, $703,961,424.41. Increase on Previous Year, $57,579,173.12, or 9 Per Cent. Net Earnings, $141,054,754.51. Increase on Previous Year, $9,563,340.57, or 7 1-3 Per Cent.

The ninth annual report of the United States Steel Corporation, which gives the results of the year ending December 31, 1910, shows a most substantial growth in the business of that great institution. The gross sales and earnings increased $57,579,173.12, or 9 per cent., on the previous year, while the net earnings increased $9,563,340.57, or 7 1-3 per cent. The report, which covers operating results of all the subsidiaries, including the Tennessee Coal, Iron & Railroad Company, enables the following comparisons of the financial results to be made:

INCOME AND SURPLUS.

	1910.	1909.
Gross receipts, sales and earnings	$703,961,424.41	$646,382,251.29
Manufacturing cost and ordinary maintenance	$529,215,788.12	$483,417,842.21
Administrative and general expenses	17,155,807.27	15,460,613.78
Taxes	9,161,436.95	8,704,193.39
Discounts and interest	3,545,810.90	3,621,613.12
Balance	$144,882,581.17	$135,177,988.79
Sundry manufacturing and operating revenues and rentals	2,728,348.14	3,385,382.24
Income from investments, &c.	3,124,820.65	3,432,616.63
Total income	$150,735,749.96	$141,995,987.66
Interest charges subsidiary companies	7,263,453.66	7,887,178.18
Balance	$143,472,296.30	$134,108,809.48
Less net balance profits earned by subsidiary companies	2,417,541.79	2,617,395.54
Net earnings	**$141,054,754.51**	**$131,491,413.94**
Depreciation funds	24,316,596.71	23,718,313.98
Balance	$116,738,157.80	$107,773,099.96
Bond interest and sinking fund	29,247,850.00	29,247,850.00
Balance	$87,490,307.80	$78,525,249.96
Sundry credit adjustments	83,122.98	548,445.08
Total available for dividends, &c.	$87,407,184.82	$79,073,695.04
Preferred dividends paid	25,219,677.00	25,219,677.00
Common dividends paid	25,415,125.00	20,332,100.00
Balance, surplus	$36,772,382.82	$33,521,918.04
Appropriations for new construction, &c.	26,000,000.00	18,200,000.00
Balance carried to surplus	$10,772,382.82	$15,321,918.04
Net increase in surplus of subsidiary companies, &c.	2,016,247.42	2,617,395.54
Previous surplus	151,354,527.75	133,415,214.17
Surplus, December 31	$164,143,157.99	$151,354,527.75

Condensed Balance Sheet, December 31

The balance sheet as of December 31, 1910, shows an apparent reduction in assets as compared with that for the previous year end. This is due to the fact that a change has been made as compared with previous years' balance sheets as to the location therein of the "accrued depreciation and replacement fund reserves," and of the account "bond sinking funds with accretions." These funds, being reserved from earnings and income to cover accruing amortization and depreciation in respect of the assets included in the "property investment" account, it has been considered advisable to state the balances thereof in the expanded balance sheet as a credit in connection with the gross property investment rather than to show them on the liability side of the balance sheet, as has been done in previous years. This makes the "property account" for December 31, 1910, in the assets shown below $117,671,520.47 less than it would have been if presented on the same basis as in former balance sheets. The following table gives the condensed balance sheet for the past two years:

	1910.	1909.
Assets.		
Property account	$1,430,212,860.76	$1,500,092,134.63
Deferred charges	8,331,704.91	6,763,191.22
Investments	2,369,394.04	2,353,109.56
Sinking and reserve fund	16,067,905.24	21,738,953.06
Inventories	176,537,823.71	163,811,279.58
Accounts receivable	44,603,273.53	56,421,438.19
Bills receivable	5,540,180.77	6,711,427.28
Agents' balances	696,833.76	788,654.21
Marketable stocks and bonds	4,410,793.61	4,764,254.65
Cash	56,953,514.16	58,521,113.04
Total assets	$1,745,724,284.49	$1,821,965,555.42
Liabilities.		
Common stock	$508,302,500.00	$508,302,500.00
Preferred stock	360,281,100.00	360,281,100.00
Outstanding stock subsidiary companies	620,352.50	619,002.50
Bonded and debenture debt	596,351,866.70	606,384,118.84
Mortgage and purchase money obligations subsidiary companies	3,097,792.38	2,763,786.03
Accounts payable and payrolls	23,695,264.04	29,734,951.20
Bills payable	813,500.00	827,000.00
Special deposits or loans due employees	886,122.16	862,767.06
Accrued taxes	6,789,827.16	5,937,244.48
Accrued interest	7,991,373.15	8,582,549.81
Preferred dividend, payable February 28	6,304,919.25	6,304,919.25
Common dividend, payable March 30	6,353,781.25	8,895,293.75
Reserve funds	20,092,727.91	69,979,985.93
Bond sinking fund	.....	44,756,000.87
Appropriations for capital expenditures	40,000,000.00	16,379,807.95
P. and L. surplus	164,143,157.99	151,354,527.75
Total liabilities	$1,745,724,284.49	$1,821,965,555.42

Maintenance and Extraordinary Replacements

The expenditures made by all subsidiary companies during the year 1910 for maintenance and renewals, including the relining of blast furnaces, and for extraordinary replacements, in comparison with expenditures for the same purposes during the preceding year, were as follows:

	1910.	1909.
Ordinary maintenance and repairs	$40,818,899.32	$34,002,389.15
Extraordinary replacements	8,489,285.64	8,514,716.32
Totals	$49,308,184.96	$42,517,105.47

The entire amount was charged to current operating expenses and to replacement funds reserved from earnings.

Expenditures for the Gary Plant

The appropriations made from surplus net income in previous years for account of this fund, as shown in annual report for 1909, amounted to the aggregate sum of $55,000,000 and there was appropriated from surplus net income of the year 1910 the further sum of $10,000,000, making a total of $65,000,000. To December 31, 1910, a net amount of advances has been made from this fund to cover expenditures for acquirement of real estate and for construction work as follows:

Gary Land Company, for the real estate, including that for steel plant (less credits for land and houses sold)	$10,509,325.07
Indiana Steel Company, for construction of the steel plant, but exclusive of land required	49,693,864.15
Total advanced from above fund	$60,203,189.22

This leaves a balance in the fund December 31, 1910, of $4,796,810.78.

A summary of property expenditures at Gary, to December 31, 1910, is made as follows:

Paid from the special surplus fund for Gary:	
Expenditures for land and for construction of steel plant and city of Gary, as above	$60,203,189.22
Financed by the following subsidiary companies, in whose interest the work was done:	
Construction of sheet plant, by American Sheet & Tin Plate Company	2,151,158.44
Construction of bridge and structural plant, by American Bridge Company	1,940,854.24
Terminal railroad work adjacent to and in connection with the manufacturing plants, by Chicago, Lake Shore & Eastern Railway Company	5,683,493.25
Total	$69,978,695.15

Employees and Payrolls

The average number of employees in the service of all companies during the fiscal year 1910, in comparison with the fiscal year 1909, was as follows:

	1910.	1909.
Manufacturing properties	154,563	138,865
Coal and coke properties	23,528	21,867
Iron ore properties	16,956	15,077
Transportation properties	20,758	17,104
Miscellaneous properties	2,630	2,587
Totals	218,435	195,500
Total annual salaries and wages	$174,955,139	$151,663,394

Production

The production of the subsidiary companies in 1910 compared with 1909 was as follows:

Products.	1910. Tons.	1909. Tons.
Iron ore mined:		
Lake Superior: Marquette Range	830,094	899,002
Lake Superior: Menominee Range	1,384,465	1,359,415
Lake Superior: Gogebic Range	1,801,480	1,312,701
Lake Superior: Vermilion Range	1,338,110	1,066,474
Lake Superior: Missabe Range	17,910,366	16,968,592
Southern—Tennessee Coal, Iron & Railroad Company's mines	1,981,301	1,824,863
Totals	25,245,816	23,431,047
Coke manufactured:		
In bechive ovens	11,641,105	11,896,211
In by-product ovens	2,008,473	1,693,901
Totals	13,649,578	13,590,112
Coal mined, not including that used in making coke	4,850,111	3,089,021
Limestone quarried	5,005,087	4,715,708
Blast furnace production:		
Pig iron	11,645,510	11,436,570
Spiegel	102,260	80,942
Ferromanganese and silicon	83,628	100,838
Totals	11,831,398	11,618,350
Steel ingot production:		
Bessemer ingots	5,796,223	5,846,300
Open hearth ingots	8,383,146	7,508,889
Totals	14,179,369	13,355,189
Rolled and other finished steel products for sale:		
Steel rails (heavy and light tee and girder)	2,118,473	1,719,486
Blooms, billets, slabs, sheet and tin plate bars	682,364	675,614
Plates	929,020	729,790
Heavy structural shapes	656,797	*614,971
Merchant steel, bars, hoops, bands, skelp, &c	1,527,506	*1,290,467
Tubing and pipe	868,550	1,013,071
Wire rods	133,722	139,149
Wire and products of wire	1,490,318	1,607,689
Sheets (black and galvanized) and tin plate	1,082,787	1,024,985
Finished structural work	589,228	530,766
Angle splice bars and all other rail joints	235,998	190,226
Spikes, bolts, nuts and rivets	71,326	*71,881
Axles	101,066	68,366
Steel car wheels	98,105	67,985
Sundry steel and iron products	148,735	*115,214
Totals	10,733,995	9,859,660
Spelter	26,777	27,853
Sulphate of iron	33,684	33,582
	Barrels.	Barrels.
Universal Portland cement	7,001,500	5,786,000

* These tonnages differ slightly from the figures shown in last year's report, but such changes do not affect the aggregate for all products. The individual differences are due entirely to a rearrangement of the 1909 results so as to conform to the classification observed in 1910.

From the general statement, which forms part of the report, as signed by Elbert H. Gary, chairman, the following excerpt is taken:

General Statement

The volume of business conducted by the subsidiary companies during 1910, as indicated both by production and shipments to the trade, showed a substantial increase over the operations in 1909. Although a material diminution occurred in the placing of orders by customers during the early summer and continued during the remainder of the year, there was not any appreciable withholding of specifications nor requests for cancellations of tonnage previously booked. Based on production of finished products for sale, the output during the first nine months equaled about 85 per cent. of normal maximum capacity; during the last quarter, 67 per cent.; and for the entire year, 80 per cent.

The shipments of all classes of products to customers outside of the organization during 1910, in comparison with 1909 were as follows:

Domestic.	1910. Tons.	1909. Tons.
Rolled steel and other finished products	9,511,694	8,690,133
Pig iron, spiegel, ferro and scrap	388,872	444,562
Iron ore, coal and coke	1,360,090	1,409,751
Sundry materials and by-products	77,223	42,435
Total tons all kinds of material, except cement	11,337,879	10,586,881
Cement (barrels)	6,679,415	5,690,891
Export.		
Rolled steel and other finished products	1,216,057	1,001,157
Pig iron and scrap	6,974	8,337
Sundry materials and by-products	465	252
Total tons all kinds of materials	1,223,496	1,009,746
Aggregate tonnage of rolled steel and other finished products shipped	10,727,751	9,691,290

The prices received for shipments made to the trade during 1910 of all classes of rolled steel and other finished products, including fabricated structural work, averaged somewhat more than those obtained in the preceding year, both in respect of domestic and export shipments.

The tonnage shipped for export in 1910 was the largest for any year since the organization of the corporation, and evidences the satisfactory progress which has been made in the extension of this branch of the business. The advantages of possessing a fair volume of export trade have been pointed out in previous annual reports.

During the year $17,295,983.29 of bonds, mortgages and purchase money obligations of the corporation and subsidiary companies were paid and retired. Of this total $7,504,000 represents bonds retired under sinking fund provisions of the mortgages securing them. Bonds of subsidiary companies to the amount of $6,279,000 were issued and sold during the year. Of this total $4,710,000 were issued and sold in lieu of an equal amount of other bonds, which matured and were paid off in 1910; the balance, $1,569,000, represents new issues made and sold to cover outlays by the subsidiary companies for additions and construction. There were also issued by subsidiary companies during the year purchase obligations to the amount of $1,300,000 in part payment for ore property acquired; and real estate mortgages amounting to $27,237.50 were assumed in connection with purchase of coal property.

The expenditures made by the corporation and the subsidiary companies during the year for additional property, extensions and construction, and for stripping and development work at mines, were as follows:

For the Gary, Ind., properties	$16,072,850.92
For Tennessee Coal, Iron & Railroad properties	3,887,078.73
For all other properties	33,141,292.15
Total	$53,101,221.80

At January 1, 1911, the amount unexpended on authorizations given for additional property, extensions, construction and extraordinary replacements, including the 1911 programme of stripping and development operations at mines, was approximately $50,000,000, divided as follows: For the properties at Gary, Ind., $15,500,000; for all other properties, $34,500,000. It is estimated that a large percentage of this total will be expended in 1911.

DEVELOPMENT AT GARY.

The construction and development work at Gary, Ind., progressed continuously and satisfactorily during the

year 1910. At the steel plant of the Indiana Steel Company six of the eight blast furnaces constructed have been satisfactorily operated. Of the three units constructed, each comprising 14 65-ton open hearth furnaces, two units have been in operation. The rail mill has been in operation since February 17, 1909; the billet mill since August 16, 1909; the 18-in. merchant bar mill since December 16, 1909, and the 14-in. merchant mill since April 1, 1910. The axle plant is completed; the 160-in. plate mill will be ready for operation by April 1, 1911, and the three remaining merchant bar mills by May 1, 1911. Since the publication of the last annual report, the construction of a continuous sheet bar mill was started. This mill will supply sheet bars for the sheet plant being constructed at Gary by the American Sheet & Tin Plate Company, a subsidiary of this corporation. The new bar mill will be ready for operation by July 1, 1911. The by-product coke plant, construction of which was begun in June, 1909, is rapidly nearing completion. This plant will have a total of 500 ovens of the Koppers type, and an annual capacity of about 2,500,000 tons. A gas distributing system is being installed, by which all of the excess gas from the coke oven plant will be utilized in mill operations.

The output of the Gary steel plant of the Indiana Steel Company in 1910 was as follows: 729,072 tons pig iron, 1,006,252 tons open hearth ingots, 435,142 tons open hearth steel rails, and 340,993 tons shapes, merchant bars and miscellaneous steel products.

In the construction of the sheet plant at Gary by the American Sheet & Tin Plate Company, there were completed during the year buildings for the four jobbing mills and for the two plate mills. Substantial progress was made toward the completion of the buildings for the 16 sheet mills. A considerable quantity of the machinery and equipment has been received and installed. It is anticipated that the jobbing mills will be placed in operation by May 1, 1911, and the remainder of the plant during the fall of 1911. The product of the mill will be light plates, black and galvanized sheets, and it will have an annual capacity of about 200,000 gross tons.

In the construction by the American Bridge Company of the bridge and structural plant at Gary, which is to consist of two units (together with auxiliary departments), one unit was practically completed at the close of the year and was placed in operation March 9, 1911. The second unit, it is expected, will be ready for operation about May 1, 1911. Each of these units is 300 x 700 ft., and will have an annual capacity of 60,000 tons of the heaviest bridge and fabricated structural work.

COAL AND CEMENT PROPERTIES.

Reference was made in the annual report of 1909 to the acquisition of coal properties in the Danville district, Illinois, and the Clinton field, Indiana. Subsequent to the publication of the report for 1909 negotiations were concluded for the acquirement of an extensive acreage of coal in Franklin County, Illinois. To the close of 1910 there had been acquired in these three fields 55,624 acres of coal rights and 742 acres of surface. An additional acreage of about 6000 acres of coal is now under option, the larger part of which will probably be acquired. On the properties in the Danville district there are opened and in operation five mine workings. In the Clinton, Ind., field there is now being constructed a double mining plant, with complete equipment, which will have a capacity of 3300 tons of coal per day. No development work has as yet been commenced in the Franklin County field. Prior to making the foregoing purchases the subsidiary companies already owned in the Illinois and Indiana fields 3742 acres of coal lands, thus giving at December 31, 1910, a total of coal territory owned in these fields of 59,366 acres. The acquisition of this substantial acreage of coal should, when developed, insure to the subsidiary companies in the Chicago district for many years a constant supply of coal satisfactory both as to quality and cost.

The extension to the cement plant at Buffington, Ind., as stated in last year's report, contemplated an addition to the producing capacity of 2,000,000 barrels of cement annually. Subsequent to the issuance of the report, it was concluded to double the size of the extension proposed, thus increasing the capacity by 4,000,000 barrels annually. Construction work has accordingly been prosecuted on this basis. It is expected that the extension will be completed and go into operation some time during the summer of 1911. With the completion of such extension the productive capacity of cement of the plants of the Universal Portland Cement Company will be 40,000 barrels per working day, a total of 12,000,000 barrels annually. This annual capacity stated in weight is equal to 2,035,000 gross tons.

IMPORTANT IRON AND STEEL WORKS EXTENTIONS.

Of the new rod mill and wire plant at Birmingham, Ala., about 40 per cent. of the entire proposed work was completed at the close of the year. All building foundations were completed, and practically all the steel framework of the buildings erected; the sewers and foundation work for the machinery were practically finished, and substantial progress had been made in the installation of machinery and equipment. It is expected that the plant will be completed and ready for operation by October 1, 1911. It will have a capacity of finished wire products of about 400 tons daily. All machinery will be electrically driven, the current being supplied from the manufacturing plant of the Tennessee Coal, Iron & Railroad Company, which company will also supply the plant with the raw steel required for its operations.

Additions were made to the manufacturing plants of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., as follows: New 34 in. billet mill to supply billets to the new wire plant above described; new electrical power plant to supply power to the wire plant and to afford additional requirements for the Ensley plant; new by-product coke plant, to consist of 280 ovens of the Koppers type; new water supply system to serve the manufacturing interests in the Birmingham district, consisting of a reservoir having a capacity for impounding 2,500,000,000 gal. of water, together with intake channel and tunnel for transmitting water to central pumping station, and distributing pipe lines therefrom. On all of the foregoing it is expected that all further work will be completed, and the several facilities be placed in operation at various dates during 1911.

Satisfactory progress was made during the year toward the completion of a new light structural mill at the South Works of the Illinois Steel Company and of a new blast furnace at Central furnaces, Cleveland, of the American Steel & Wire Company. Both of these additions will be completed during the year 1911. At Lorain works of the National Tube Company a new motor driven continuous mill for rolling skelp was completed and placed in operation. Extensive outlays were made during the year by subsidiary transportation companies for the acquirement of additional equipment and for other construction work, including additional second tracks, new spurs, yards, terminals, &c. There were purchased by the subsidiary railroad companies 117 additional locomotives and 3212 cars of various kinds as additions to the equipment lists of the companies. There were also delivered and placed in service five 12,000-ton steamships for service in the ore carrying trade on the Great Lakes. Of these five vessels, two were on replacement account, and three added to the complement of the fleet. There was purchased one ocean-going freight steamship for service in the export trade.

Reference was made in the annual report for 1907 to the acquirement of a site for and the proposed construction of a moderate sized steel plant at Duluth, Minn. During 1908 and 1909 the work done in connection with this proposition consisted only of preparing the site for the steel plant, the acquirement of right of way for and some construction work on the terminal railroad connecting the proposed steel plant with all trunk lines entering Duluth. In the early part of 1910 construction work was actively undertaken on both the steel plant and railroad. During the year 1910 a total of $1,715,517.70 was expended on these properties. It is expected that further construction will be prosecuted during 1911. The plant as proposed will include the following producing departments: two blast furnaces, seven open

hearth steel furnaces, one 40 in. booming mill, one 28 and 18 in. rail and bar mill, 16, 12 and 8 in. merchant mill, and by-product coke plant of 90 ovens, together with the necessary complement of auxiliary departments, such as power plants, pumping stations, machine and other shops, &c.

LABOR MATTERS.

A general increase was made during the year in the salaries and wages of a large proportion of the employees of the subsidiary companies, such advances extending to about 83 per cent. of the total number of employees. The advances were made as of January 16, 1910, in the case of the coke companies, and as of May 1, 1910, in the case of substantially all of the other subsidiary companies. These advances averaged for all employees effected an increase of about 6.23 per cent. in the salary and wage rates previously paid. The increased amount paid out in salaries and wages during the year 1910 by reason of the foregoing advances in rates was, approximately, $5,968,000, equal to an increased annual payment, on basis of the same number of employees as were in service during 1910, of about $8,400,000.

On May 1, 1910, the several subsidiary companies inaugurated a voluntary accident relief plan under which provision is made for relief of employees injured in service, and for the families of men killed in work accidents. The provisions are purely voluntary on behalf of the companies without any contribution whatsoever from the employees. In principle, the plan is similar to the German and other foreign laws, and to recommendations which have been made by employers' liability commissions in the United States. Payments of relief are to be made in respect of all fatal accidents, and of injuries necessitating the loss of more than ten days' service; payments are also made irrespective of the question of legal liability on the part of the employer, this feature being largely disregarded under the plan. There is no obligation upon employees to accept relief under the plan if they otherwise elect. The relief is greater for married than for single men, and increases according to the number of children and length of service. During temporary disablement single men receive 35 per cent. of the rate of wages they were receiving when injured, and married men 50 per cent., with an additional 5 per cent. for each child under 16, and 2 per cent. for each year of service above five years. For permanent injuries or death, lump sum payments are provided. Experience will perhaps lead to some modification of the details of the plan. The plan has been well received by the employees and is considered entirely successful.

On January 1, 1911, there was inaugurated a system of old age pensions for employees of the corporation and its subsidiary companies to be paid from the United States Steel and Carnegie Pension Fund, under rules established by its Board of Trustees. This fund was created by the joint action of the United States Steel Corporation and Andrew Carnegie. For this purpose the corporation is to provide an aggregate principal sum of $8,000,000, which, with the Carnegie Relief Fund of $4,000,000, created by Mr. Carnegie in 1901, makes a joint fund of $12,000,000. This fund will be administered and the net income from it will be distributed in pensions by a board of twelve trustees. Under the pension rules adopted by this board three classes of pensions are provided: 1. Pensions by compulsory retirement, granted to employees who have been 20 years or longer in the service, and have reached the age of 70 years for men and 60 years for women; 2. Pensions by retirement at request, granted to employees who have been 20 years or longer in the service, and have reached the age of 60 years for men and 50 years for women; 3. Pensions for permanent incapacity, granted to employees who have been 20 years or longer in the service, and have become permanently and totally incapacitated through no fault of their own. The monthly rates of pension are: For each year of service, 1 per cent. of the average regular monthly pay received during the last 10 years of service, provided, however, that no pension shall be more than $100 per month nor less than $12 per month. The pension plan involves no contribution whatsoever by the employees themselves.

Obituary

ANTHONY G. BRUNSMAN, president of the Anchor Buggy Company and Lion Buggy Company, Cincinnati, Ohio, and one of the best known vehicle manufacturers in the West, died March 16, at his home in Avondale suburb, aged 45 years. He was president of the National Carriage Builders' Association and a member of several prominent clubs in Cincinnati. He leaves a widow.

CHARLES ELLIOTT MITCHELL, New Britain, Conn., prominent as a lawyer, president of the Stanley Rule & Level Company, and United States Commissioner of Patents under President Grant, died March 17, aged 73 years. After graduating from Brown University he studied law at the Albany Law School, and upon taking his degree began the practice of his profession in New Britain.

NATHANIEL THAYER, Boston, Mass., died March 21, aged 60 years. He was a director of the United States Steel Corporation at the time of his death, having been a director from its organization. He was vice-president of the old North Chicago Rolling Mill Company, which was merged into the Illinois Steel Company.

JOHN B. MCDONALD, New York City, died March 17, aged 67 years. He was born in Ireland and was brought to this country when three years old. He received a public school education and spent his early manhood helping his father who had become a contractor. Embarking in the contracting business on his own account, he was successful from the outset. His name has been identified with many important projects. He built Baltimore's underground belt line system. His most important work was the construction of the New York Subway.

COL. LEWIS T. BROWN, for many years superintendent of the Pittsburgh city mills of the Carnegie Steel Company, died at Atlantic City, March 19, aged 66 years. He was born in Pittsburgh and resided there practically all his life until five years ago. His first connection with steel manufacture was with the Shoenberger Steel Company. He became superintendent at the Union Mills of the Carnegie firm in 1872 and later was put in charge of the Carnegie Steel Company's city mills, acting in the latter capacity until January 1, 1905. He enlisted in the 13th Regiment, Pennsylvania Volunteers, in 1861 and took part in all the important battles of the Army of the Potomac. After three years' service he was transferred to the 2d U. S. Cavalry with which he served in the Indian campaign of 1866 and 1867. He was an officer in the Pennsylvania National Guard and was aide-de-camp on the staff of Governor Pennypacker with the rank of lieutenant-colonel. He was also appointed on the staff of Governor Stuart of Pennsylvania.

EPHRAIM SMITH, Boston, Mass., for many years identified with the steel industry, died March 14, aged 70 years. A native of Clinton, Allegheny County, Pa., he learned the trade of gunmaker with his father. He served in the Civil War in the 149th Pennsylvania Regiment, was with Sherman in Georgia, and was a captive in Libby Prison. At the close of the war he entered the steel business, and several patents were issued to him for processes in manufacturing high grade steels. He was associated with Hussey, Howe & Co., Pittsburgh, afterward Howe, Brown & Co., and 20 years ago went to Boston as the agent for the house. He represented the Colonial Steel Company in Boston from the beginning of that industry until his retirement a year ago. He leaves a widow and two daughters.

The West Penn Plating & Mfg. Company, 1308-10 East Ohio street, North Side, Pittsburgh, which does high grade electroplating in all metals, has recently extended its operations in the manufacture of pipe hooks, straps and hangers, and is about to make these articles in a variety of sizes and in larger quantities. Additional floor space has been secured, new punch presses have been installed, and the installation is being considered of a small foundry to produce aluminum and brass castings, which will be required in the manufacture of a new specialty.

Business Administration as a Constructive Science*

A Discussion of Organization, Standards and Records, the Stimulation of Administrators as Well as Operatives—The Work of Efficiency Specialists

BY H. F. STIMPSON.†

The old proverb says: "First catch your hare; then cook it." So, in considering the application of the science of administration to business, we must first select the business itself. This will depend upon various things—the personal tastes, experience and abilities of the individual, the location, the conditions of supply and demand, &c., of the proceedings. The individual will find, as at all future stages, that while he can and should get the advice of many, he cannot delegate the responbility of digesting and applying the advice. Having carefully considered various lines of business in the light of the above, and having settled upon some line as the most suitable one for him under the circumstances, the prospective business man will find that this one decision, together with the circumstances in connection with it and him, has practically established a foundation from which all future action must be developed and with which it must be in harmony.

Assuming that the intention is to manufacture, a unit of the product must be minutely separated into its prime or indivisible factors as to material, form and process. This reveals the physical operations which are necessary for its production, and the operations determine the apparatus which must be employed to perform them, each successive step being a logical development from that preceding it.

The Production of Force

At this point we are confronted with the problems of producing the force by which this apparatus is energized, and, as has been seen in the foregoing article, it is of two principal types: physical, which may be either of mechanical or animal origin, and mental.

The mechanical force must be determined, both as to character and quality, and traced back to its origin, which may be in coal or other fuel, in the rushing stream, in the wind, or in an animal, and the necessary apparatus for transmitting, controlling and generating it must then be determined. Each unit of mechanical force and of animal force, except that of human origin, requires human physical force to control it and human mental force to direct it; so that we must not only determine the quantities of these, but trace the mental force back to its point of origin in the minds of the owners of the business, and determine the necessary means for its transmission, control and generation.

Relation of Departments

It is at this time that we discover the relations which exist between the producing, selling, financing and other divisions of a business and their natural and logical sequence; this sequence being one of chronology, rather than of intrinsic importance. It is only when these relations and sequences are properly adjusted that the ultimate measure of success can be achieved. Because the possibilities resulting from such an adjustment are realized, or even imagined, by only a very few men, such adjustments are rarely made at present. One hears much complaint regarding the burden imposed by the large number of so-called "nonproducers." The real trouble is not with their large numbers, but with their small numbers and low efficiency. As the case usually presents itself, most of the administrators are simply "human telephones" who merely transmit descriptions of desired results. The formulation of the methods by which these results are to be obtained is largely in the hands of the actual workers or their immediate supervisors. This is all wrong. A number of comparatively poorly trained workers, ably directed, will be more efficient than an equal number of skilled workers, poorly directed. If then, in any concrete instance, we consider the training of the workers as a fixed quantity, for the time being, it is obvious that in order to bring about the most immediate improvement, the primary effort in that direction should be exerted by the directors or administrators of the enterprise.

Owners and Managers

At this point consideration must be given to the dual character, seldom realized to the fullest extent, of organizations. First, we have the owning element, which may be either one or more individuals. This element possesses and exercises the right of decision as to what things are to be done. Second, we have the operating element, always composed of many individuals of varying degrees of authority and responsibility, which does or should possess and exercise the right to decide how things are to be done.

The science of administration is manifestly applicable almost solely to the second element; and the point of application should, therefore, be at its head, which is also the point of contact with the first element. This point of contact is usually personified by the individual acting as president and general manager. He is the "dividend maker" for the business, and is, therefore, presumably open to every influence which will legitimately increase their volume. But because, as has been said in the last article, the general manager is frequently without broad administrative training, but has attained his position through marked ability in one of the divisions of a business, he is so bound up in such division that he sacrifices, or at least is indifferent to, the interest of the other divisions. Hence, when the dividends become impaired, the first element often finds itself obliged to decide that one of the things to be done is the application to the business of the services of a specialist, in order to determine what must be done to restore the destroyed balance between the divisions. This condition is always to be deplored, because the man who should eagerly receive, assimilate and act upon the advice so tendered, makes its reception needlessly difficult. When, however, the application is made at a point much further down the line, or when the specialist is unable to cover the entire field, an infinitely worse condition is created. This is the reason why many specialists in betterment lines, where work is excellent so far as it goes, are unable to produce as great or as lasting benefit as they and their clients desire. The different phases of a business are so interwoven that it is almost impossible to improve one division without coming in contact with the others. Because it is far more difficult to co-ordinate the work of several specialists than to do the work of any of them, such co-ordination is generally far beyond the client's ability, and therefore, what should be sought is the advice of an aggregation of specialists, co-ordinated under a competent head.

Planning of Organizations

In the design of a building the engineer begins with the arrangement of the features for which it is neces-

* A series of three articles. The first appeared in *The Iron Age* of January 26, 1911, page 248; the second in *The Iron Age* of March 16, page 662.

† Chief engineer Universal Audit Company, New York.

sary to make provision in the first story of the structure. Subsequently he determines the necessity for and arrangements of succeeding stories until all the accommodations required have been planned for. The engineer then retraces his path, working downward from the roof to the foundations because the supports in each story must carry the accumulated weight of the part of the building which lies above, and designs the structural work accordingly. He then goes over the work a third time, and actually constructs the building from the ground up.

In like manner an organization must be studied: First, the workers necessary for the operation; second, the various grades of supervisors and directors, gradually decreasing in number with increase in rank, until the apex is reached. Means for the formulation and transmission of directions (not merely the telephoning of orders) as to performance, including the necessary standards, from the chief administrative officer down to the lowest employee, must then be devised. The next step is the provision of means for the collection and transmission of accurate records of actual performances, from the lowest worker to the chief executive, in such a manner as to correspond exactly with the standards accompanying the directions. This will facilitate the making of the comparisons which are essential to the efficient conduct of the business.

Standards and Records

From this analysis we perceive a curious thing which has taken place in the development of most lines of business—namely, that cost and other records were developed *before* standards. Their development, therefore, has been largely empirical rather than logical. Hence many elaborate systems have failed to produce satisfactory results. This trend of effort, moreover, has had the effect of causing business men to endeavor to get the information from one element which can only be obtained from a comparison of two elements. It has also blinded their eyes to the omission of the determination of standards from its proper place in the sequence, which is before the records.

In this connection, another circumstance, previously alluded to, is of interest. The employer, being pushed further and further away from the worker, by the size of the business, has decreased in the ability to give clear directions as to the desired performances, without making provision for the supplementing of his ability in this respect. His directions, acquired by experience, having been given orally, he does not realize that they are no longer given. Because he has generally recruited his administrative assistants from the clerical ranks, these directions are less and less frequently supplied, and the workers are forced more and more to depend on their own initiative. The result is to-day that the majority of information as to proper methods is possessed by the workers rather than by the administrators or executives. This information is at present largely in the nature of transmitted legend, and grows more and more vague with each generation. Unless scientific men are not only allowed, but urged, to take up the study of the productive methods for the operation of human minds and hands, as well as the operations of machinery, we shall surely and certainly come to a standstill. We know very little to-day about the possibilities of human physical effort and next to nothing about mental effort.

The Work of the Specialists

When the business man, therefore, decides to avail himself of the services of an association of specialists in the development of his business, he should give them his full confidence and co-operation. This should be warranted by his previous investigation of their standing. Every facility should then be afforded for a thorough examination of the business as a whole. They should first make an exact statement by text and charts of the conditions encountered. From this should be evolved a comprehensive plan of the remodeled organization and its methods of operation. This should be earnestly studied by the client in conjunction with the advisor.

When the plan has been perfected and the client is thoroughly conversant and in harmony therewith, the work of installation may begin. It will generally be found that the administrators and supervisors are far too few to handle the work properly. No new man should be brought in from the outside, if any present employee can be developed to fit the demands. It is not necessary to wait for the full development of the subject matter of the directions and records before filling up the gaps in and realigning the organization, providing the proper lines of transmission have been worked out. Direct improvement, in a considerable measure, can be secured from a correctly apportioned organization, even if some of the members are rather new to their duties. It is manifest that, in an electric installation, all the units of apparatus must be in place before the current can be made effective in any degree. The service, however, can be greatly improved by careful adjustment as time goes on. Hence, the full complement of organization, by being enabled to give greater attention to the methods then in use, can secure better results from the start.

Standards are the basis of directions. These must next be determined by the client's employees delegated for the purpose and acting under the guidance and instruction of the specialists. Standards for human performance must be based on the amount of force a normal man can generate without loss of elasticity under proper conditions. As these are determined it will gradually become possible to comprehend the conditions which do or should exist, and hence to issue more adequate directions.

The next step is to revise the conditions so as to make it possible for the workers to comply with the standards. Every stumbling block in their pathway must be removed, if they are to achieve the anticipated results. Simultaneously the records must be so developed as to correspond accurately with the standards and directions in every detail. There must be both a record and a standard for every operation performed. The comparison between these two is of the most vital importance and cannot be overestimated.

Stimulation for Administrators

When a proper organization and conditions have been created, together with safe and sane standards for desired performances and accurate records of actual achievements in every department, it is possible to stimulate and encourage the workers to come up to the standards by making their compensation dependent in part upon their effort and commensurate with its amount. In considering this phase of the subject too much stress cannot be laid on the importance of applying this principle to the administrators and supervisors as well as to the manual workers. One of these individuals, since he controls many workers, is responsible for a larger amount of concrete results than any one of them; therefore his compensation should be determined on a corresponding basis.

The usual supervisor or administrator is too often a human telephone, and is of correspondingly little value. The trained supervisor or administrator must be developed by his employer, in view of the shortcomings of our educational system in this respect, and is correspondingly valuable. This principle is applicable to the entire operating organization, from errand boy up to General manager.

After these methods have been installed and placed in operation much thought should be given to their maintenance and continued improvement. The records should be continually searched for indications as to the possibility of improvement. Suggestions from the operating organization should be referred to the standardizers who can work them out to the best advantage, and should do so as a part of their routine work. The makers of the suggestions should, of course, be adequately rewarded.

What Specialists' Study Discloses

The specialist, as has been said, should be an association of specialists, rather than an individual. It is to the client's interest to place the matter in the hands of such an organization from the start. This will result

in his being supplied with the proper men whom he needs as permanent advisors, and in placing him in a position to secure from time to time harmonious advice in other lines where only occasional assistance is required.

No specialist, whether permanently or temporarily a part of the organization, should ever give an order or direction. The exercise of this power should be confined strictly to the members of the operating organization. The function of the specialist in administration is to intensify the mind of the administrator by his advice just as the gas flame is intensified by the oxygen introduced by the blowpipe.

The specialist should make close observations of operations, deduce his conclusions and communicate them to the administrator of the proper grade, but it is only as he can inject his mental force into the mental force of the administrator that he can attain success. He should only discuss the work on the spot as a last resort, and when the mind of the administrator is such that an ocular demonstration is essential to his receipt of the suggestion. A study of the usual administrative methods from the scientific standpoint discloses:

(*a*) The terrific load of petty detail carried by men whose time is too valuable to devote to such things.

(*b*) The inability of administrators to work at arms' length through the mediums of standards and records and their infatuation for close contact and its consequent loss of perspective.

(*c*) The widespread failure to use well known, effort saving devices—telephone, telautograph, pneumatic tube, &c.

(*d*) The lack of realization of the necessity of using the cheapest man for the job in administration as well as manual work and, coincidently, that the best is always the cheapest.

(*e*) The lack of realization that the coal, boilers, engine and generator must be adequate to the task or the lamps will not burn or the motors move.

(*f*) The lack of realization that the advice of specialists is absolutely essential in order to create a proper organization.

(*g*) The lack of realization that the chief executives must devote their personal time and effort to the study of the advice of the specialist and to its application.

(*h*) The lack of realization that administration, or the operation of this human machine, is a science in itself.

The Foundry Exhibit at the Pittsburgh Convention

Announcement is made that the exhibit of foundry equipment and supplies by the Foundry and Machine Exhibition Company, which will be held in connection with the convention of the allied foundrymen's associations at Pittsburgh, beginning Tuesday, May 23, will be kept open until Thursday, June 1. This extension of time is due to the fact that the American Society of Mechanical Engineers will hold its spring meeting in Pittsburgh in the week following the foundrymen's convention. The applications for space in the Exhibition Building were so many that much more room has been required than was originally laid out. The entire main building of the Western Pennsylvania Exposition Society on Duquesne way has now been secured, giving space larger than is afforded by the Madison Square Garden, New York.

The Buffalo Chamber of Commerce and the foundrymen of that city are actively at work to secure for Buffalo the next convention of the allied foundrymen's associations. The Buffalo foundrymen are arranging for special cars to the Pittsburgh convention in May, and are planning to make a strong bid for the meeting of 1912.

The heating and ventilating contract for the new 10-story Hartman Building, Columbus, Ohio, was awarded to the William H. Conklin Company, heating contractor of that city. The Buffalo Forge Company, through its Cincinnati office, will furnish the ventilating apparatus, which consists of four fans of the multivane type, with direct-connected motors furnished by the Allis-Chalmers Company, and 3,000 ft. of Vento hot blast radiation.

Railroad Efficiency and the Labor Unions

Strikes of Machinists and Boilermakers Show the Attitude of Organized Labor

BY "EFFICIENCY."

Our magazines and periodicals are still devoting much space to efficiency systems and scientific management for the railroads. "Saving $1,000,000 a Day for American Commerce" and "Wonderful Economics Possible for Our Railroads Through Scientific Management" are catch phrases which make good headlines. But the authors of these articles do not produce anything practical. They go over the old story without suggesting a single practical remedy.

Hampton's for March contains a long article by Cleveland Moffett under the above captions. Mr. Moffett follows the easy method of the ordinary chronicler of "news," and assumes that there is no barrier to the introduction of these systems into the railroad shops except the alleged stupidity of the railroad managers. In other words, all that is required of them is that they educate themselves up to an efficient standard and then insist that their workmen adopt the same standard.

In treating of the predicament in which the railroads find themselves to-day in any effort they may make to install efficiency and scientific management systems in their shops, I called attention in your issue of February 23 to the manner in which these railroads are being ground between the upper and nether millstones of the open and the closed shop labor unions. The open shop unions are those known as the railroad brotherhoods—engineers, firemen and conductors. Those organized upon the principles of the closed shop are machinists, boilermakers, iron molders, switchmen, blacksmiths, patternmakers. Those of the latter class are affiliated with the American Federation of Labor; the former are not. Every railroad in the United States and Canada enters into annual agreements covering methods and conditions of employment for members of the brotherhoods. In 1910 fifty-six railroads are reported as having entered into agreements with the machinists' union. Other metal trade craft employees in railroad shops are handled in much the same manner, and all operate in compliance with union rules and restrictions.

Efficiency or scientific management systems are simply refined bonus, piecework or premium systems. When the efficiency system was first exploited before the Interstate Commerce Commission in the hearings on freight rates recently the unions of labor throughout the country, both open and closed shop, were quick to observe its relation to the old-time bonus, piecework or premium system which they had been fighting for many decades—some of them for more than half a century. Promptly the officials of all these unions decided that they must oppose the introduction of these old systems, even though under new names, into the railroad shops of which they had control. There was absolutely nothing new in this decision of the unions. It was simply the continuation of an old policy, as so patently exemplified in the strikes of machinists from the shops of the Baltimore & Ohio Railroad beginning in the year 1909, and those even of so recent occurrence as February of this year in the machine shops of the Lake Shore & Michigan Southern.

Efficiency Systems Create Differentials

Manufacturers accustomed to dealing with labor unions are quite familiar with the opposition of the latter to what is known as a "differential." This term when applied to the employment of labor comprehends varying rates of wages for the competent, the incompetent, the energetic man and the laggard. The same is true in the application of the efficiency system, and quite properly so. But to the labor union all its members look alike. The union must depend for its income upon the competent as well as the incompetent; it is no respecter of ability. Quantity in membership is much more to its

liking, and this it must have if it is to succeed. It is absolutely out of the question for the labor union, as at present organized, to attempt to say to one member that his wages shall be dependent upon his ability; consequently a flat or minimum rate must be provided below which the employer must pay at his peril. Likewise the union member accepting compensation below the minimum specified by his organization does so at his peril.

Nowhere is this position more clearly shown than in a resolution adopted at the 1907 convention of the International Molders' Union. It reads as follows:

Resolution No. 56: That the incoming officers use their best endeavors to eliminate the differential in the molding industry.

Imagine a railroad or any employer attempting to introduce an efficiency system into a shop in which the union standing sponsor for a resolution such as this had full control! The result would be a strike forthwith. It has meant a strike wherever it has been attempted for fifty years or more.

Prolific Strike Causes

In a report prepared by the president of the International Association of Machinists and printed in the *Journal* of that organization in September, 1910, page 835, the statement is made that the most prolific causes of strikes among members of this organization for that year had been:

(1) The introduction of piecework, (2) the introduction of running two or more machines by one man.

The principal strikes in which members of the machinists' union were involved in that year were on the Baltimore & Ohio Railroad, including the B. & O. Southwestern Railroad, to prevent the introduction of piecework and the enforcement of the agreement existing between this railroad and the union. During the period July 1, 1909, to June 30, 1910, the machinists' union struck all the shops on six different railroads in its attempts to compel the operation of these shops in accordance with its rules and regulations, which comprehend most emphatic objections to any and all forms of efficiency or scientific management systems.

The Latest "Efficiency" Strike

The latest strike from railroad shops against efficiency and piecework systems is that of the boilermakers employed by the Lake Shore & Michigan Southern Railroad in 14 different cities. This particular railroad established a piecework system for its boilermakers on January 3 of this year, by which it is acknowledged by the workmen their wages were materially increased and conditions were otherwise satisfactory. An edict issued from the headquarters of the boilermakers' union, however, commanded its members to strike against the system, and they were compelled to obey. Whether the machinists will go out in sympathy with the boilermakers remains to be seen.

The unfamiliarity of railroad managers with the methods of unionism, however, is definitely shown in this statement given out by an official of the Lake Shore road at Cleveland:

The boilermakers really have no grievance. Half of them were put on piecework and their wages were increased from 30 to 50 per cent. as a result. It appears, however, that piecework is contrary to their constitution and a change was demanded.

"It appears" that piecework is contrary to the boilermakers' constitution. In these few words is told the whole story of railroads and the labor unions. Not only are the constitutions of these unions opposed to piecework now, but they have been ever since the birth of labor unionism. The very fact that the railroad officials, as well as those who are urging them to put the efficiency systems into effect, are no more familiar with the principles of these unions than to state that "it appears" that piecework is contrary to their constitution demonstrates beyond question that none of them has studied the question sufficiently to deal with the problem effectively.

The crux of the whole situation lies in the unpreparedness of the railroads and their management to deal with the labor problem. What they know of it they have learned from but one side. They have even gone so far as to enter into an unholy alliance with their workmen to create a favorable public sentiment for increased freight rates, which might be compared to the pouring of water in a sieve.

Let the railroads take a leaf from the book of the manufacturer in the handling of the labor problem. Let them descend from the lofty position they have occupied for years and profit by the experience of others — cooperate with them, if need be — and by far the greater portion of their labor difficulties will disappear. Thus only is there a possibility of realizing the highest efficiency both in management and operation. Then, and then only, would it be possible to save a million dollars a day both to the railroads and the shippers of the country.

The Great Northern Ore Report

The trustees of the Great Northern Iron Ore Properties have made their report for the year ending December 31, 1910. The income account, compared with the two years preceding is as follows:

	1910.	1909.	1908.
Dividends	$2,105,000	$1,560,000	$1,745,000
Interest and miscellaneous receipts	6,479	.....	4,214
Totals	$2,111,479	$1,560,000	$1,749,214
Expense of trustees	$67,628	$77,094	$75,390
Distributed to certificate holders	2,250,000	1,500,000	1,500,000
Totals	$2,317,628	$1,577,094	$1,575,390
Deficit	$206,148	$17,094	*$173,824
Previous surplus	238,979	256,073	82,249
Profit and loss surplus	$32,831	$238,979	$256,073

* Surplus.

Referring to the operation of the Hill ore properties, particularly those of the United States Steel Corporation, whose mining company for the Hill properties is known as the Great Western Mining Company, the report says:

Dnuring the year 1910 the shipments of ore from the properties of the companies in which the trust is interested amounted to 5,470,270 tons, as against 3,016,619 tons in 1909. From the notices received from the Great Western Mining Company and other lessees of their contemplated operations during the year 1911 it is expected that the ore shipments will be increased the coming season. The work of exploration and development called for by the lease of the Great Western Mining Company has continued to be prosecuted during the year 1910, with the result of putting the properties in such condition that shipments therefrom can be made to the full extent provided by the terms of the lease. In January, 1911, the Great Western Mining Company paid the minimum royalty called for by the lease for the year 1910. The amount of this royalty stands as a credit against future shipments to be made by the Great Western Mining Company and can only be distributed to the various companies whose stocks are held in trust by the trustees, when their respective properties thereof shall have been ascertained by the results of actual mining. In the meantime these funds will be placed so as to earn the best rate of interest consistent with safety; and such sums as may be collected hereafter, which may not be immediately apportionable, will be similarly placed from time to time as collected.

Pittsburgh Standard Reinforcement for Concrete.—A leather bound handbook of 399 pages 4 x 6½ in., has been issued by the Pittsburgh Steel Products Company, an identified interest of the Pittsburgh Steel Company, Wallace H. Rowe, president. It gives tables and other data relative to Pittsburgh standardized reinforcement for concrete. The company has prepared this blue book to enable engineers, architects and builders to design concrete structures without laborious mathematical computations. The girder, beam and slab tables have been computed so that under a dead and live load and figured on the basis of the "straight line formula" the tensile stress in the steel will not exceed 16,000 lb. per square inch and the compressive stress in the concrete will not exceed 650 lb. per square inch. Illustrations are given of the Pittsburgh standard bars and of typical frames and standard reinforcement for beams, girders and slabs. The tables have been prepared after formulas recommended by a joint committee on concrete of the American Society for Civil Engineers, American Society for Testing Materials, American Railway Engineering and Maintenance of Way Association and the Association of American Portland Cement Manufacturers.

Pipe and Plumbing Jobbers' Conventions

At the closing session, March 15, of the second annual convention of the National Association of Jobbers of Wrought Iron Pipe at the Hollenden Hotel, Cleveland, new officers for the ensuing year were elected as follows:

President, C. H. Simmons, John Simmons Company, New York City; first vice-president, O. F. Felix, Pittsburgh Supply Company, Pittsburgh, Pa.; second vice-president, A. L. Scott, Pacific Hardware & Steel Company, San Francisco, Cal.; treasurer, C. G. Cornell, Jr., Cornell & Underhill, New York City; advisory secretary, T. James Fernley, Philadelphia, and secretary, Thomas A. Fernley, Philadelphia. W. M. Pattison, W. M. Pattison Supply Company, Cleveland, Ohio, was elected a member of the Executive Committee, succeeding A. L. Scott. Other members of that committee were re-elected as follows: F. M. Sheldon, Braman, Dow & Co., Boston, Mass.; E. G. Cuyler, Cuyler & Mohler, Baltimore, Md.; C. V. Kellogg, Kellogg-Mackay Company, Chicago, Ill.; Samuel H. Moon, Ahrens & Ott Mfg. Company, Louisville, Ky., and J. P. Hartnett, L. M. Rumsey Mfg. Company, St. Louis, Mo.

Plumbers' Supply Jobbers

The convention of the wrought iron pipe jobbers was followed March 16 and 17 by the first annual convention of the National Association of Jobbers of Plumbers' Supplies, quite a number of jobbers being members of both organizations. With the exception of the opening meeting, the sessions were executive. Among the topics discussed were discount sheets, resale prices, inventory of stock, inroads made by specialty houses on profitable lines of the plumbing supply business, cost of doing business and unreliable salesmen. Action was taken favoring the sale of plumbing supplies direct by plumbers if buyers want such supplies without the services of the plumber to do the installing. The president and secretary were instructed to present this matter to the National Association of Master Plumbers, and urge the adoption of this policy by the latter organization. This action was taken with the view of having the plumbers meet the competition of the mail order houses.

At the annual election, C. V. Kellogg, Kellogg-Mackay Company, Chicago, was re-elected president. Other officers were chosen as follows: First vice-president, O. J. Saxe, Dalton-Ingersoll Mfg. Company, Boston, Mass.; second vice-president, J. P. Fell, W. A. Case Sons Company, Buffalo, N. Y.; treasurer, J. Harvey Borton, Haines, Jones & Cadbury Company, Philadelphia; secretary, Thomas A. Fernley, Philadelphia. Executive Committee: George H. Bailey, Bailey-Farrell Mfg. Company, Pittsburgh, Pa.; J. B. Rahm, United States Supply Company, Omaha, Neb.; Charles W. Frean, John Simmons Company, New York City; A. A. Tomlinson, Virginia-Carolina Supply Company, Norfolk, Va.; A. B. Pierce, N. O. Nelson Mfg. Company, St. Louis, Mo., and A. A. Merkel, Merkel Brothers, Cincinnati, Ohio.

Both associations selected Atlantic City as the next meeting place.

The new blast furnace F of the Bethlehem Steel Company, at its Lehigh plant, South Bethlehem, Pa., was blown in last week. Furnace G, which, like furnace F, is 22 x 90 ft., and has five stoves, is nearing completion.

Annealing Malleable Castings*

Differing Physical Properties Due to Varying Heat Treatment

BY W. P. PUTNAM.†

To emphasize the importance of exercising greater care in manufacturing malleable castings and to point out some sources of the errors that are so frequent in foundries leaving the annealing process to the judgment of some individual with a "trained eye," the work of this paper was undertaken. There is no branch of the foundry business that needs closer supervision than the process of annealing iron; no greater source of economy; no one department where greater skill is required. And yet it is safe to say that very few foundries recognize the importance of equipping their annealing ovens with proper appliances to insure a uniform product.

To call attention to the variations that can be produced in the annealing process, a set of test bars was made and sent out to 11 malleable iron foundries to be annealed in accordance with their usual practice. The bars were all made from the same metal and an attempt was made to obtain a bar free from shrink or draw in the center by casting the bars with large ends. In all of the bars that were broken but very little draw was found. The analysis of the metal poured into the bars was as follows:

	Per cent.		Per cent.
Silicon	0.74	Manganese	0.24
Sulphur	0.041	Combined carbon	2.70
Phosphorus	0.148		

Table 1.—Results of Annealing Bars of the Same Composition at Different Foundries.

Foundry No.	Total carbon.	G. C.	C. C.	E. L. Lb. per sq. in.	T. S. Lb. per sq. in.	Elongation in 2 in. Per cent.	Reduction in area. Per cent.	Kind of packing.	Time of annealing. Hours.	Annealing temperature. Deg. F.
1	1.49	1.49	Trace	20,823	40,996	8.59	12.13	Slag	112	1,450
2	1.94	1.94	Trace	34,134	44,034	10.15	13.87	Mill scale	144	1,700
3	1.47	1.47	Trace	29,276	39,638	8.59	17.63	Mill scale	101	1,620
4	0.86	0.77	0.09	31,428	48,489	8.59	19.18	Not given	Not given	Not given
5	1.74	1.74	Trace	30,960	45,760	8.59	14.88	Not given	Not given	Not given
6	1.71	1.71	Trace	28,326	40,408	8.59	15.00	None	72	1,650
7	1.32	1.18	0.14	32,224	49,107	8.59	13.23	Not given	Not given	Not given
8	0.80	0.80	Trace	33,333	47,336	7.60	17.27	Slag	208	1,620
9	1.58	1.58	Trace	30,833	39,862	7.03	19.51	Mill scale	168	Not given
10	0.40	0.40	Trace	41,792	50,849	7.45	20.92	Mill scale	96	2,200
11	1.32	1.32	Trace	35,042	45,213	7.80	12.56	Slag	144	1,700
Hard iron	2.70				50,846					

The results obtained on the annealed bars are given in Table 1. It will be noticed that in each case under too high temperature or a long period of annealing, the carbon was nearly all removed. Either practice is wasteful and produces poor malleables for some purposes.

The annealing process should be conducted to produce definite results. Metal intended for parts where machining is necessary should be given a different treatment in the annealing process from that of metal that does not need to be machined.

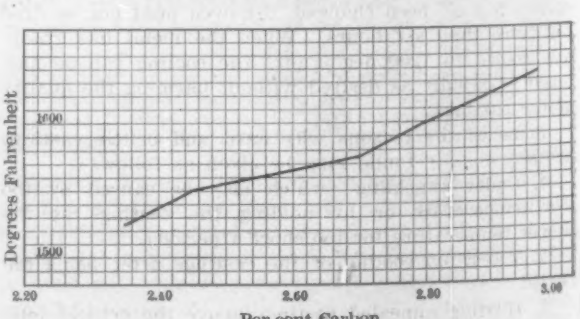


Chart 1.—Proper Finishing Temperature for the Annealing of White Iron, in Relation to Carbon Contents.

To arrive at the proper annealing temperature the critical and proper annealing temperature was ascertained on a number of hard iron specimens ranging

* A paper read before the Detroit Foundrymen's Association.
† President Detroit Testing Laboratory.

from 2.35 to 3 per cent. total carbon. These temperatures are diagrammatically shown in chart No. 1. They are accurate within 10 deg. Fahr.

In chart No. 2 is shown the curve of a typical annealing cycle in an oven containing 14 tons of castings. The carbon in this lot of iron was 2.65 per cent. After reaching the annealing temperature there is no further rise in the temperature of the metal until all of the carbon has changed into the graphitic condition. As soon as the change has been completed the temperature will rise in accordance with the temperature of the oven. It has been found that to heat the castings much above the proper annealing temperature for a long period is not only unnecessary but a waste of fuel, and

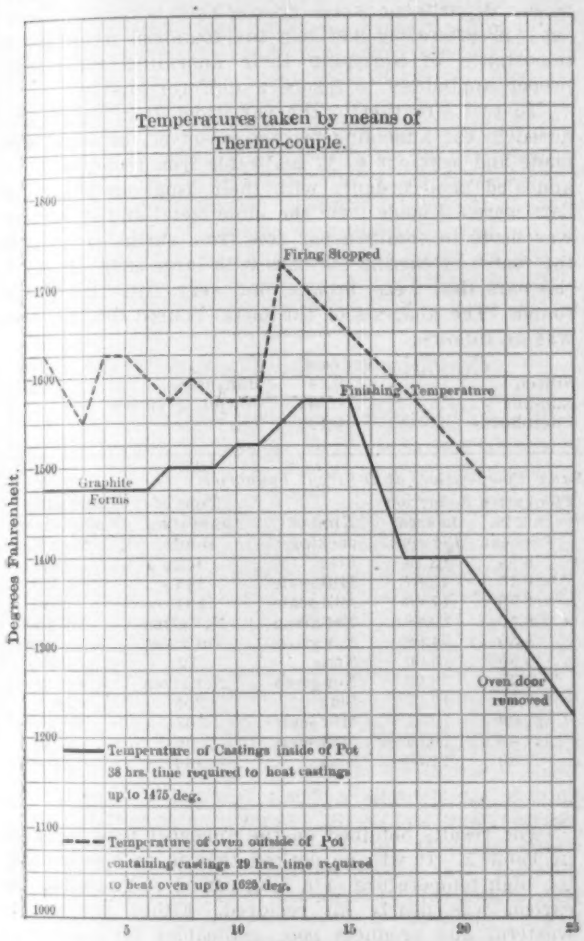


Chart 2.—Curve of a Typical Annealing Cycle.

produces poor castings for some purposes. After the carbon has all been changed the oven need not be fired for more than six hours. When the metal has gradually cooled to 1200 deg. Fahr., the cooling can be hastened as rapidly as desired without harming the quality of the castings.

Some of the reasons why hard and brittle castings are occasionally found may be given as follows:

1. Under annealing (which may be caused by too low temperature or by holding the castings at the proper temperature for too short a period).

2. Too rapid cooling of the castings after being annealed.

3. Heating annealed castings above the critical temperature to straighten without subsequent annealing.

That there is great need of the systematic handling of the annealing process is clearly evident from the results tabulated in Table 1. The variations shown there are typical of castings in general.

The Gregg Company, Ltd., has just completed a large and modern factory at Hackensack, N. J., of more than three times the capacity of its present plant at Newburgh, N. Y. The company expects to begin manufacturing operations in the new plant about April 1, and will continue to confine its efforts entirely to standard and narrow gauge sugar plantation railway equipment. It will remove its general offices to Hackensack. The company maintains branch offices at 80 Wall street, New York; New Orleans, La.; Havana, Cuba; San Juan, Porto Rico, and Honolulu, Hawaii.

Vice-President Dickson's Resignation

The resignation of Wm. B. Dickson as first vice-president of the United States Steel Corporation was announced in the past week by Chairman Gary as follows:

Mr. Dickson has tendered his resignation as vice-president, to take effect May 1, much to my regret, for he has been a most efficient and loyal officer. I am sorry he is not in the city, as I would prefer to have him make the announcement. The resignation will, of course, be accepted. Mr. Dickson has the best wishes of all of his associates for the future.

When the United States Steel Corporation was formed Mr. Dickson was made assistant to the president, Charles M. Schwab, going to New York from Pittsburgh, where he was a managing director of the Carnegie Steel Company. He entered the steel industry in 1881, and for three years was active in the converting, blooming and rail mills at Homestead of what was then the Pittsburgh Bessemer Steel Company, later taken over by the Carnegie Steel Company. He was transferred to the general office of the Carnegie Steel Company in 1889, and in 1899 became a partner. In 1902 he became second vice-president of the United States Steel Corporation, and was made first vice-president on the resignation of James Gayley late in 1908. He was president of two subsidiary companies, the Minnesota Steel Company and the Union Steel Company.

Mr. Dickson's identification with the corporation's betterment work is well known. He took a strong stand in favor of the reduction of Sunday labor to a minimum at the plants of all the Steel Corporation's subsidiaries. His paper read at the American Iron and Steel Institute's New York meeting of May 27, 1910, advocating the adoption of a plan whereby no individual workman should be on duty more than six consecutive days, helped to create sentiment for the six-day week, and resulted in the appointment of a committee of steel manufacturers to report on the subject. At the October, 1910, meeting of the Institute in New York he read a paper on the "Betterment of Labor Conditions in the Steel Industry," in which he described some of the work of the United States Steel Corporation in reducing seven-day labor to a minimum and in establishing accident relief and pension systems. Mr. Dickson's work in these lines carried weight not only without but within the steel trade, because it was appreciated that he advocated betterment not as an idealist, but as one whose experience in the mill and on the commercial side of the business made his suggestions practical and reasonable.

The National Metal Trades Association's New Officers

Following is the list of officers which will in all probability be elected at the coming thirteenth annual convention, at the Hotel Astor, New York City, April 12 and 13:

President, F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, Ill.; first vice-president, Henry D. Sharpe, Brown & Sharpe Mfg. Company, Providence, R. I.; second vice-president, W. A. Layman, Wagner Electric Mfg. Company, St. Louis, Mo.; treasurer, Howard P. Eells, Bucyrus Company, South Milwaukee, Wis. Councillors for two years, J. H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia, Pa.; C. Bermingham, Canadian Locomotive Company, Ltd., Kingston, Ont.; L. H. Kittredge, Peerless Motor Car Company, Cleveland, Ohio; W. H. Van Dervoort, Root & Van Dervoort Engineering Company, East Moline, Ill.; A. E. Newton, Prentice Bros. Company, Worcester, Mass.; P. O. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio. Councillor to serve unexpired term, Stevenson Taylor, Quintard Iron Works, New York City.

The Sloss-Sheffield Steel & Iron Company Report

In its report for the year ended November 30, 1910, the Sloss-Sheffield Steel & Iron Company shows the following income account statement, which is compared with those for 1909 and 1908.

	1910.	1909.	1908.
Profit on pig iron	‡$474,407	$896,816	$889,652
Profit on coal	113,189	119,695	99,190
Profit on coke	159,401	162,013	132,829
Ore and dolomite sales	.....	.....	388
Rent, royalties, &c	219,029	233,356	141,684
Interest and exchange	34,975	52,466	21,996
Total income	$1,001,002	$1,454,347	$1,285,740
Taxes and licenses	68,285	57,964	55,593
Balance	$932,717	$1,396,383	$1,230,147
General expenses	51,193	59,435	56,187
Net earnings	$881,522	$1,336,947	$1,173,960
Bond interest	210,000	210,000	210,000
Surplus	$671,522	$1,126,947	$963,960
Preferred dividends	469,000	469,000	469,000
Balance	*$202,522	$657,947	$494,960
Common dividends	375,000	500,000	425,000
Deficit	$172,477	†$157,947	†$69,960
Previous surplus	3,279,522	3,121,574	3,146,386
Total surplus	$3,107,044	$3,279,522	$3,216,346

† Surplus.
* Equal to 2.02 per cent. earned on $10,000,000 common stock, as compared with 6.58 per cent. earned on same stock last year.
‡ After charges against coal, for depreciation on iron ore, 25 cents per ton on iron for extraordinary repairs and renewals, and 35 cents per ton profit on coke manufactured.

The profits for 1907, which was the last good year the company had, were $493,286 after paying common stock dividends of $500,000. The gross sales and earnings last year were $5,020,177, against $6,397,961 in 1909, $5,536,811 in 1908 and $6,654,303 in 1907. The working capital fell from $2,070,575 November 30, 1909, to $1,624,227. The cash and bills and accounts receivable November 30, 1910, were $933,149, against $1,623,560 one year previous. The payrolls and bills and accounts payable were $934,772, against $576,708 on November 30, 1909. The general balance sheet as of November 30 compares as follows:

Assets.

	1910.	1909.
Property account	$21,998,492	$21,746,010
Treasury account	244,243	244,218
Stocks and bonds in other companies	399,157	399,157
Cash bills and accounts receivable	933,149	1,623,559
Supplies raw and finished material	976,506	341,009
Stocks in company's stores	73,460	75,676
Extension, renewal and replacement fund	110,466	121,222
Unexpired insurance and taxes	6,342	5,379
Totals	$24,741,816	$24,556,230

Liabilities.

Preferred stock	$6,700,000	$6,700,000
Common stock	10,000,000	10,000,000
Bonds	4,000,000	4,000,000
Current accounts	837,948	480,784
Payrolls	76,823	95,924
Surplus	3,107,044	3,279,522
Totals	$24,741,816	$24,556,230

Comment on an Unsatisfactory Year

President J. C. Maben has the following on the course of the company's business in 1910:

"We delivered during the fiscal year 120,000 tons less iron than in 1909, which caused us to add largely to the accumulated stock of iron on our furnace yards. The result of the year's business of the company was not satisfactory; but this was due not so much to the conditions of the trade as to the misfortune which overtook the company near the close of the last fiscal year, in the flooding of the two slopes of its Sloss ore mines, to which reference was made in the last annual report; and there is reason for believing that but for this the business of 1910 would have proved about as satisfactory as for 1909. No ore was taken from these mines from the beginning of the fiscal year until June, when we began producing a limited amount from No. 2 slope, which forced us to use ore not carrying sufficient lime to flux the furnace burden, and lean ores which we were compelled to buy from others to keep even three of the Birmingham furnaces working, which increased the cost of our iron very much, at a time when the pig iron market was depressed and prices declining.

"Had we had the use of the Sloss ore, even in an amount equal to what we are now receiving we could have met the market and showed a reasonable profit on iron. The output of these mines is now steadily increasing, and we hope before long to have the output up to normal. While the output has not as yet reached the tonnage for producing the best furnace results, either as to production or cost, we are receiving sufficient tonnage of this ore to reduce the cost of iron for January in the Birmingham furnaces over $1.50 per ton below the average cost of the first six months of the year. The poor results of business must, therefore, be charged not against the property or plants, but to the misfortune which befell the Sloss mines, and which is being overcome.

"The fiscal year closed with over 74,000 tons of iron on our furnace yards, and this tonnage has been considerably increased since then, which has caused the creation of a floating debt, from which the company, with the exception of a temporary loan in 1907, has been entirely free for six years. The working capital showed a decrease in the year of $446,000, which is due to decline in the market value of securities as of November 30, the heavy expenditures necessitated by the flooding of the ore mines, the opening of the third iron ore mine at Irondale, refitting Nos. 1 and 2 furnaces, and a deficit for the year of $172,000 after dividend payments."

Conditions in the Foundry Trade

Reports furnished the *International Molders' Journal* by the various local unions indicate in general that the foundry trade in most lines is not satisfactory. Here and there improvement is noted but in other cases dullness has been accentuated. It would probably be correct to say that the number of molders employed throughout the country has varied little in the past three months. The reports referred to indicate that the foundry trade is fair at Philadelphia; St. Louis (stove); Rochester, N. Y.; Indianapolis, Ind.; Louisville, Ky.; New York; Toronto, Ont.; Detroit, Mich.; Erie, Pa.; Atlanta, Ga. Reports of bad, poor, slack or dull trade come from Troy and Albany, N. Y.; Buffalo, N. Y.; Pittsburgh, Pa.; Brooklyn, N. Y.; Newark, N. J.; Wilmington, Del.; St. Louis, (machinery and bench); Utica, N. Y.; Schenectady, N. Y.; Milwaukee, Wis.; Peoria, Ill.; Denver, Colo. (strike), and Moline, Ill. For the most part the above statements refer to the machinery trade. In some cities different local unions represent malleable, brass, stove plate and machinery lines, and conditions are not uniform in all.

The International Molding Machine Company

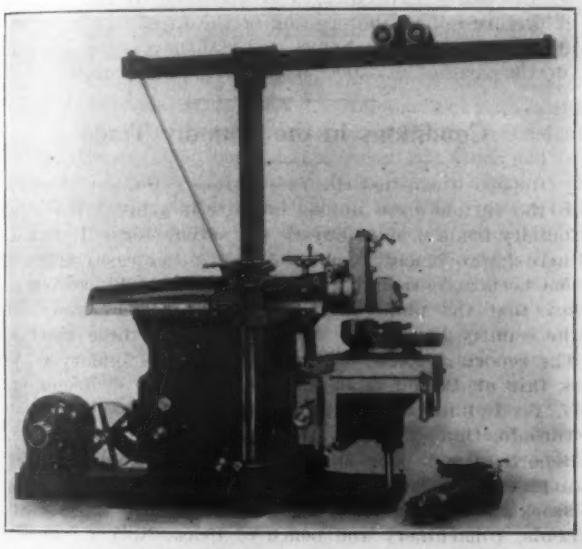
The Edward A. Pridmore Company, Chicago, Ill., the name under which Edward A. Pridmore, W. W. Miller and D. C. Snow of Chicago have been doing business, has been changed to the International Molding Machine Company. The molding machines designed and manufactured by this company will hereafter be known to the trade as the International machines. The company's office and shops will be at 2300-2319 South Western avenue, as heretofore. J. W. Dopp, formerly Western sales manager of the Tabor Mfg. Company, Philadelphia, has accepted the position of general sales manager of the company. Mr. Dopp is a foundryman of large practical experience and a molding machine expert, having had charge for a number of years of the molding machine departments of several of the largest shops in the country, one of which was the Cambridge, Mass., Works of the International Steam Pump Company.

The Ives Modern Bedstead Company, Ltd., Cornwall, Ontario, Canada, states that the loss of stock by the fire in its branch warehouse in Montreal, February 27, amounted to about $16,000, fully covered by insurance. Occurring in a warehouse, it in no way affected the company's general trade. New premises have been secured, and the Montreal business is continued without any interruption.

A Cincinnati Shaper with Jib Crane

Recently the Cincinnati Shaper Company, Elam street and Garrard avenue, Cincinnati, Ohio, completed a 32-in. heavy duty back geared crank shaper which is of interest on account of the special equipment furnished with it. The most noteworthy feature is a revolvnig jib crane 9 ft. high and having a capacity of 1500 lb. Other portions of the equipment include a 10-hp. constant speed motor, transmitting its power through a belt to the gear box; a power driven concaving attachment, an extended circular feeding head with both hand and power feed and a special type of table with a tilting top.

The shaper is of the maker's standard type, and in designing it care was taken not only to secure ample power but to provide the rigidity necessary to withstand the strains to which it is subjected in service. The bearing of the ram in the column is wide and long. The rail is deep and of heavy construction, reinforced with horizontal ribs and securely gibbed to the column, with felt wipers between these two parts. The cross traverse screw has a graduated collar reading to 0.001 in., and a



A 32-In. Back Geared Crank Shaper with Locomotive Outfit and Jib Crane Built by the Cincinnati Shaper Company, Cincinnati, Ohio.

variable automatic feed which can be adjusted from zero to full feed while the machine is running.

The head swivels to any angle and is locked in the desired position by a simple and efficient locking device. The desired angle is secured by a set of graduations on the base. The down feed screw has a graduated collar reading to thousandths of an inch. Full length taper gibs which are adjustable endwise by single screws are used throughout for the ram, head, rail, apron and crank wheel slides. An automatic adjustment for the cross feed connecting rod is furnished for any hight of rail, which does not depend upon frictional contact. The construction of the rocker arm is strong and heavy, and convenient means for lubricating the arm are furnished. A table support is regularly furnished with each machine which has a base stiff enough to withstand the thrust put upon it and a sliding surface under it exactly parallel with the table. The telescopic elevating screw is under the rail, where it is free from falling chips, and has ball bearings. The vise is of the maker's improved double screw form and has a graduated swivel base. Its construction enables straight or tapered pieces to be clamped with equal facility and rapidity. Annealed tool steel is used for the vise jaw plates. An opening through the column under the ram enables keyseats to be cut in shafting and similar pieces. The length of the stroke and its position can be changed while the machine is in motion or at rest. The length of the stroke is controlled from the working side of the machine and its position by a handwheel on top of the ram.

The following table gives the principal dimensions and specifications of the tool:

Extreme length of stroke, inches	33
Horizontal travel of table, inches	32
Vertical travel of table, inches	15
Maximum distance between table and ram, inches	17¼
Minimum distance between table and ram, inches	2¼
Diameter of head, inches	11
Feed to head, inches	10
Length of table top, inches	30
Width of table top, inches	24
Depth of table, inches	20
Length of ram bearing in column, inches	46
Width of ram bearing in column, inches	13
Key seating capacity, inches	4
Size of tool handled, inches	1 x 2¼
Size of vise jaws, inches	16 x 3½
Opening of vise, inches	12
Width of belt, inches	4
Ratio of single gear	7.2 to 1
Ratio of back gear	30 to 1
Number of ram speeds	8
Maximum number of cutting strokes per minute	71
Minimum number of cutting strokes per minute	6
Size of motor, horsepower	10
Capacity of crane, pounds	1,500
Hight of crane, feet	9
Weight of machine, pounds	9,370

Carbon steel is used for the shafts, and all the bearings are long and well braced in the column. The gears and T-slots are cut from the solid, and all the flat sliding surfaces are hand scraped. Cast steel pinions are used throughout, and the miter gears are cut from a solid bar.

The Erie Railroad Ore Docks in Cleveland

The Erie Railroad Company, through H. E. Gilpin, general agent, Garfield Building, Cleveland, Ohio, is sending out a circular calling attention to the extension of its ore handling facilities in Cleveland during the past year, and its new coal handling plant, now in the course of erection. The ore docks of the Erie Railroad in Cleveland are operated by the N. Y. P. & O. Dock Company, for which Pickands, Mather & Co. are the agents. These docks have a frontage of 2700 ft. They are equipped with four Brown Hoist electrically operated 5-ton and five Hoover & Mason steam operated 5-ton unloaders, having a total maximum unloading capacity of 30,000 tons a day. The recent erection at Randall, a suburb of Cleveland, of a Wellman-Seaver-Morgan car dump, with an unloading capacity of 15,000 tons in 10 hours, and a Heyl & Patterson 10-ton ore bridge, electrically operated, and covering an area of about 15 acres, provides storage facilities for a practically unlimited quantity of ore. The railroad is installing a new car dump, built by the Wellman-Seaver-Morgan Company, on the west bank of the Cuyahoga River in Cleveland. This plant will have a capacity of 15,000 tons a day and a dock frontage of 3000 ft. It will be ready for service at the opening of navigation.

Canada's Mineral Output in 1910

All previous records in the output of Canada's mines were broken in 1910, according to the report of the mines branch of the Geological Survey issued at Ottawa, March 6, which shows the value of the output to be $105,040,958, an increase of more than $13,000,000 over 1909 classified as follows:

Gold, $10,224,910; copper, $7,209,463; pig iron, $11,245,630; nickel, $11,181,310; silver, $17,106,604; asbestos, $2,476,558; coal, $29,811,750; natural gas, $1,312,614; cement, $6,414,315; clay products, lime, $1,131,407; stone, $3,449,772.

During the year there was an increased production in every province, except New Brunswick, which showed a falling off of less than $100,000. Nova Scotia increased from $12,504,810 to $14,050,534, Quebec from $7,086,265 to $8,193,275, Ontario from $37,374,577 to $43,017,026, Manitoba from $1,193,377 to $1,470,776, Saskatchewan from $456,246 to $557,806, Alberta from $6,047,447 to $7,876,458, British Columbia from $22,479,006 to $24,547,817, and the Yukon from $4,032,678 to $4,737,375.

The Cambria Steel Company's New Wire Plant

Re-entrance of This Company in the Wire Trade

The ever-memorable Johnstown flood, which took place May 31, 1889, completely wiped out the wire rod and wire mills of the Cambria Steel Company at Johnstown, Pa., which had for many years been operated under the name of the Gautier Steel Department of the Cambria Iron Company. About a year ago it was decided to re-enter the wire trade and on a more extensive scale than before. Plans were made and contracts were placed with the Morgan Construction Company, Worcester, Mass., for the erection of a rod mill with its necessary equipment of heating furnaces and gas producers.

The site selected for the new mill comprises about 21 acres, located on the main line of the Pennsylvania Railroad at Sheridan Station, a short distance west of Johnstown, along the Conemaugh River. The new works are connected with its other plants by the extensive inter-works railroad system operated by the Cambria Steel Company. Actual work on the erection of the new plant was started October 8, 1910, when the first excavation was made, and in spite of many delays, on account of bad weather and other causes, fast progress was made, and the rod mill was completed and put in operation February 14. The whole plant has been designed to secure the lowest possible cost in operation and has the most modern equipment throughout. The ground plan is shown in Fig. 1. Descriptions of the various departments follow.

The Boiler House

This is a brick and steel building, 44 x 85 ft. It houses three 524 h.p. Babcock & Wilcox vertical water tube boilers, with Babcock & Wilcox superheaters in the same setting, equipped with Taylor stokers furnished by the Lenher Engineering Company, New York City. These boilers are equipped with sufficient stoker capacity to operate normally at about 50 per cent. higher than rated capacity, giving about 2400 h.p. capacity at 150 lbs. gauge and 150 degrees superheat. The coal is delivered from hopper bottom cars to a track hopper and is then taken in elevators and conveyors to storage bins, suspended from the roof of the boiler house, from which it is delivered through pipes to the stokers. The ashes are collected in dump buckets running on a tramrail suspended under the boiler-room floor and delivered to a skip which elevates them to an overhead bin, from which they drop through a chute into standard gauge cars.

The Rod Mill

As a preliminary step to the building of the rod and wire mills, the company erected billet and sheet bar mills, which were completed early in 1910, and which were fully illustrated and described in the issue of *The Iron Age* of May 5, 1910. The rod mill, just completed, is of the Morgan two-strand continuous type. The billets, which are 30 ft. in length and 1¾ in. square, are brought from the billet mill by the inter-works railroad system, and delivered to the billet storage yard, which is 480 ft. in length by 100 ft. wide and commanded by a 15-ton electric overhead crane, furnished by the Alliance Machine Company, Alliance, Ohio.

The billets are conveyed to the Morgan continuous heating furnaces, Fig. 2, with an inclined floor, by a Morgan conveyor of the usual type, and after being heated are delivered directly to the first stand of the roughing train. The rod mill has six roughing stands and 10 finishing stands, or 16 in all. Fig. 3 presents a general view of this mill, while Fig. 4 illustrates the roughing train alone for the purpose of showing the location of the Edwards flying shear. The finished rods, on leaving the last stand of the finishing train, run through water cooled pipes to Morgan improved vertical pouring reels, shown in Figs. 5 and 6. The bundled rods are mechanically dumped from the reels on an endless chain conveyor, which delivers them directly on rod trucks of standard type in the rod storage building.

The Rod Mill Engine

The rod mill is driven by a cross compound Corliss engine of exceptionally substantial design built by the Southwark Foundry & Machine Company, Philadelphia, Pa. It is shown in Fig. 7. The high-pressure steam cylinder is 34 in. in diameter, and the low-pressure steam cylinder is 64 in. in diameter, both 54 in. stroke. The engine runs at 85 to 100 rev. per min. It is designed to run condensing, with a steam pressure of 160 lb. The pistons are of the marine type and are supported clear of the cylinders, by the main and tail rod crossheads. The high-pressure and low-pressure piston rods are 8 in. and 11 in. diameter, respectively, and are extended to form tail rods. The bed plates are of the bored type and are in one piece, with especially large bearing surface on the foundation. Substantial sub-bases extend under the cylinders and support the tail rod guides.

The shaft arrangement is unusual. On one end of the main shaft is a steel disk crank, on the other a steel fan-tail crank. The pin in this latter crank, which is 18 in. in diameter, extends beyond the connecting rod into a floating box in a third crank, which is on a separate shaft driving the mill. The engine has four bearings, three 20 in. in diameter by 38 in. long and one 20 in. in diameter by 45 in. long. On the extended crank shaft is a pulley weighing 100,000 lb., 18½ ft. in diameter by 50 in. face and made in two pieces. There is no pulley or fly-wheel on the main shaft. The connection between the crank shaft carrying the pulley and the main crank shaft is through a spherical adjustable box amply lubricated, so that the engine will run without strain on the shafts even if the bearings are not kept in perfect alignment. This feature has been used successfully at various places by the Southwark Foundry & Machine Company and has given long service.

One of the most interesting features of the engine is the valve gear. The high-pressure cylinder is provided with one eccentric so that steam may follow nearly the full stroke when required, but nevertheless the Corliss valves will be positively pushed shut before the end of the stroke and there is no possibility of steam blowing through during the exhaust stroke. The high-pressure cylinder is provided also with the Edwards secondary cam on the admission valves. This cam, which is entirely independent of the ordinary cut-off cams, comes into action only when the load is very light and prevents the engine from taking only a very small quantity of steam each stroke. The engine either takes sufficient steam to carry in the lubricant and give proper action, or else it takes none at all. Running light, it therefore takes no steam on most of the strokes but takes a fair amount every now and then, somewhat after the fashion of a gas engine. This system is found to work well to keep the engine properly lubricated and to avoid the racking of the engine and valve gear which occurs in most Corliss engines when they are running under very light load.

The fly-wheel is sufficiently heavy and the governor sufficiently sensitive so that no appreciable irregularity of speed results. The steam valves are of unusually large area as compared with the areas of the pistons. The valve stems are massive and are supported at their inner ends in sockets in the valves, and do not rub on the holes in the bonnets. The outer ends of these valve stems are supported in spherical bearings which adjust themselves automatically to any wear in the valves and prevent the bending strains which would otherwise occur in the valve stems.

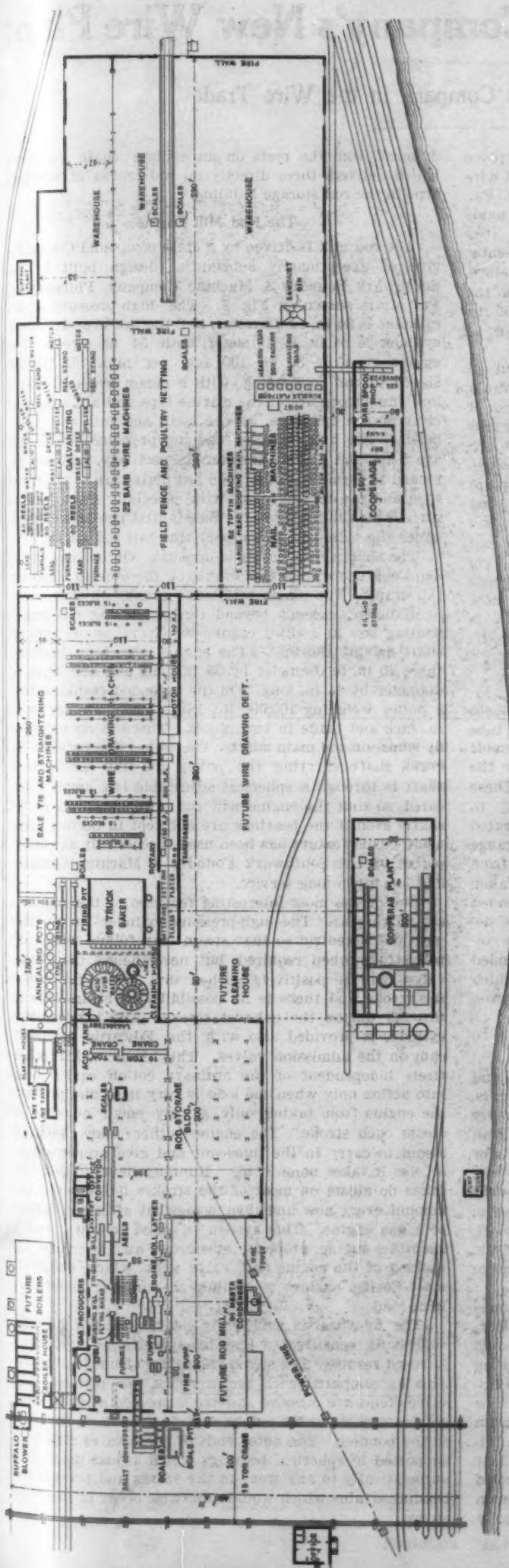


Fig. 1.—Plan of the New Wire Plant of the Cambria Steel Company, Johnstown, Pa.

Every lever in the valve gear is double and is arranged so that the pull is central with the support, and there is no tendency to twist any part of the gear or wear it crooked. No rods are carried on overhanging pins and even the clips are supported at both ends. This last is quite important as it enables clips nearly twice as long as those usually provided in Corliss engines to be used in this engine. The full length of the clip is available without having to have an unusual amount of overlap, since the clips cannot get oblique to each other, being supported at both ends.

The engine is connected to a Helander barometric condenser, furnished by the Mesta Machine Company, Pittsburgh.

The rods are piled in the storage building, which is 200 ft. square, in sufficient quantities to insure at all times an ample supply for use in the wire mills. From the storage building the rods pass through the rod cleaning room, which is 80x90 ft., equipped with acid and lime vats, the usual steam cranes and rust rack, where the scale is removed and they are otherwise cleaned and are then coated with lime preparatory to drawing. They are then put through a baker supplied by Humphrey & Sons, Joliet, Ill., and are ready for the drawing department.

The Wire Drawing Department

This department will be housed in a steel and brick structure, 110 x 360 ft., which is not yet completed. In it will be installed 182 drawing blocks furnished by the Turner, Vaughn & Taylor Company, Cuyahoga Falls, Ohio, of which 152 will be used for drawing the coarser grades of wire and 30 for the finer grades.

The arrangement of the wire drawing room is novel, in the fact that the benches on which the blocks are mounted are placed at right angles to the axis of the building, with a passage way for rod trucks down either side. The shafting for driving the wire blocks is under the floor level, the floor being entirely clear and unobstructed around the benches. The wire benches are driven through gearing by electric motors, and grouped so that there are four 300-hp. motors, each driving two benches of 18 blocks, one 150-hp. motor driving a heavy bull frame of eight blocks and another 150-hp. motor driving two benches of 15 blocks for drawing the finer grades of wire.

This arrangement permits the motors to be located in a narrow building, running parallel to the wire drawing building, so that the motors and main gears are entirely protected from the dust and dirt in the drawing room. The floor of this motor building is sufficiently below the floor of the wire drawing building to permit the motors to be set at an elevation which makes them easily accessible and at the same time permits the shafting driving the blocks to be placed under the floor of the drawing department.

The location of the wire drawing building and motor house is such that, when desired, the capacity of the plant can be doubled by simply adding another building on the opposite side, the additional motors to be placed in the narrow building referred to above.

Between the wire drawing room and the main line of the Pennsylvania Railroad will be located the annealing house, which

will be 46x360 ft., of steel and brick construction, and will be equipped with 10 annealing pots of the usual type. The firing rooms for these pots and for the Humphrey bakers will be located on the same sub-floor level and will be served by coal bins under a track to be located between the bakers and annealers, this arrangement reducing the firing labor to a minimum. The annealing pots will be served by a 5-ton electric traveling crane of the Shaw type. In one end of the annealing house will be located machines for making bale ties and probably machinery for making fine annealed wire and other special products, but definite plans for this have not yet been made.

Galvanizing, Wire Nail, Barb Wire and Fence Departments

The galvanizing room will occupy a portion of a building 330 ft. in length and 280 ft. in width. This building will be divided into three sections, each 110 ft. wide, one of which will be occupied by the galvanizing room, another by the barb wire, field fencing and poultry netting departments and the third by the wire nail machines.

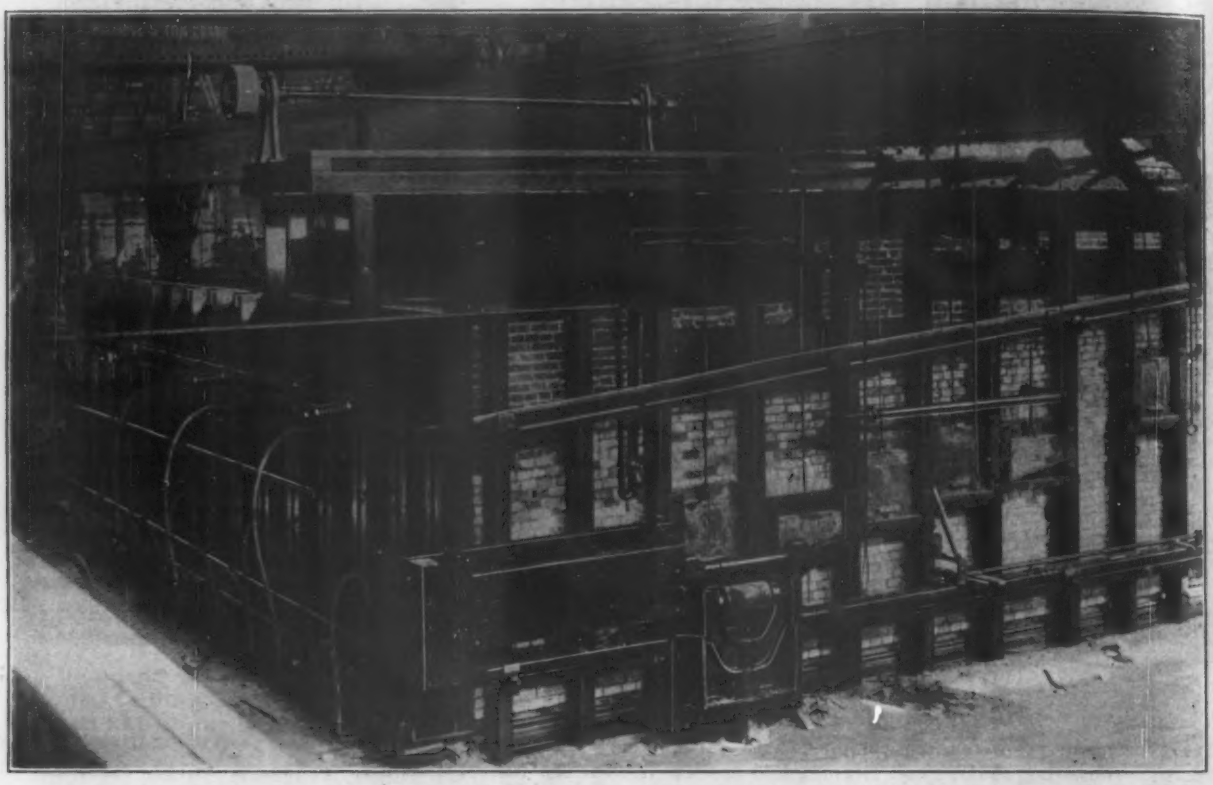


Fig. 2.—The Morgan Continuous Heating Furnace for Heating Billets.

Fig. 3.—General View of the Roughing and Finishing Trains of the Morgan Rod Mill of the Cambria Steel Company.

Fig. 5.—The Rod Reels Before the Erection of Platforms.

The galvanizing room will be equipped with three strings, each consisting of the usual cleaning and spelter baths, and having a full equipment of reeling frames made by Humphrey & Sons, Joliet, Ill. Two of these frames will have a capacity of 30 wires each of the coarser grades, and the third 24 wires of the finer grades.

The wire nail plant will contain 82 wire nail machines, furnished by the National Machinery Company, Tiffin, Ohio, and five machines for making special roofing nails. It is the intention of the company to manufacture all sizes, from 12-in. spikes down to brads ¼ in. long, and it will also make a specialty of large head roofing nails. The wire nail plant will further be equipped to furnish cement coated, blued and galvanized nails.

In the barb wire department will be placed 22 machines of the most modern design. Among the different kinds of wire to be made will be Cambria Perfect, Cambria Special, Conemaugh Two-Point, Conemaugh Four-Point, Conemaugh Special, Glidden Two-Point, Glidden Four-Point and Glidden Special.

The field fence department will manufacture square and hexagonal mesh field fence and poultry netting of all widths and sizes, staples for both fence and poultry netting and other allied products. The company is now

Fig. 6.—The Rod Reels After the Erection of Platforms.

building in its own shops, under the supervision of the inventor, two machines for the manufacture of the Holmquist improved poultry netting.

The Copperas Plant

To avoid polluting the Conemaugh River, the company has arranged to take the spent acid from the rod cleaning room through acid proof conduits to a copperas plant to be contained in a building, 80x200 ft., equipped with modern machinery for the manufacture of copperas. This plant is to have a capacity of about 300 tons per month and the output will be sold to paint manufacturers and also used for fertilizing and disinfecting purposes.

Fig. 4.—The Roughing Train of the Morgan Rod Mill of the Cambria Steel Company, Showing the Edwards Flying Shear.

Until the wire drawing and wire nail departments are in operation, the output of the rod mill, which is expected to be 350 tons per day, will be sold in the open market. It is expected to have the wire drawing plant ready in April, followed closely by the galvanizing, nail and fence departments, the entire works to be operative by early summer.

J. E. Longren, for some years superintendent of the wire department of the Colorado Fuel & Iron Company at Pueblo, Col., has been appointed superintendent of this plant of the Cambria Steel Company, and it was largely under his supervision that it has been erected.

The Coke Producers' Association

At a well attended meeting of the Coke Producers' Association of the Connellsville Region, held at Uniontown, Pa., March 15, the following officers and committees were unanimously elected: President, Harry Whyel, Whyel Coke Company; vice-president, James R. Cray, Puritan Coke Company; treasurer, G. S. Harah, Puritan Coke Company; secretary, Ernest H. Rowe. Executive Committee, chairman, Harry Whyel (president) ex-officio; C. E. Lenhart, Fayette Coke Company; J. P. Brennan, Thompson Connellsville Coke Company; L. W. Fogg, Tower Hill Connellsville Coke Company; W. A. Stone, Waltersburg Coke Company, and J. R. Cray. Membership Committee, chairman, W. A. Stone; J. B. Topham, Sunshine Coal & Coke Company; J. W. Abraham, South Fayette Coke Company. Mining Committee, chairman, O. W. Kennedy, Orient Coke Company; Geo. Whyel, Consolidated Connellsville Coke Company, J. P. Brennan, L. W. Fogg and W. A. Stone. Social Committee, chairman, D. B. Stauft, Taylor Coal & Coke Company; I. W. Semans, Hustead-Semans Coal & Coke Company, and G. S. Harah.

The Empire Iron & Steel Company has completed five new single puddling furnaces in its mills at Niles, Ohio, to bring its manufacturing facilities to a point where the increasing demand for Empire Old-Fashion Iron can be supplied promptly at all times. Exclusive use of special analysis pig iron and Beaver ore fix in all of the company's puddling furnaces insures the desired uniform high standard of the output from the standpoint of material used, while the solution of the all-important human factor has been arrived at by employing only veteran puddlers.

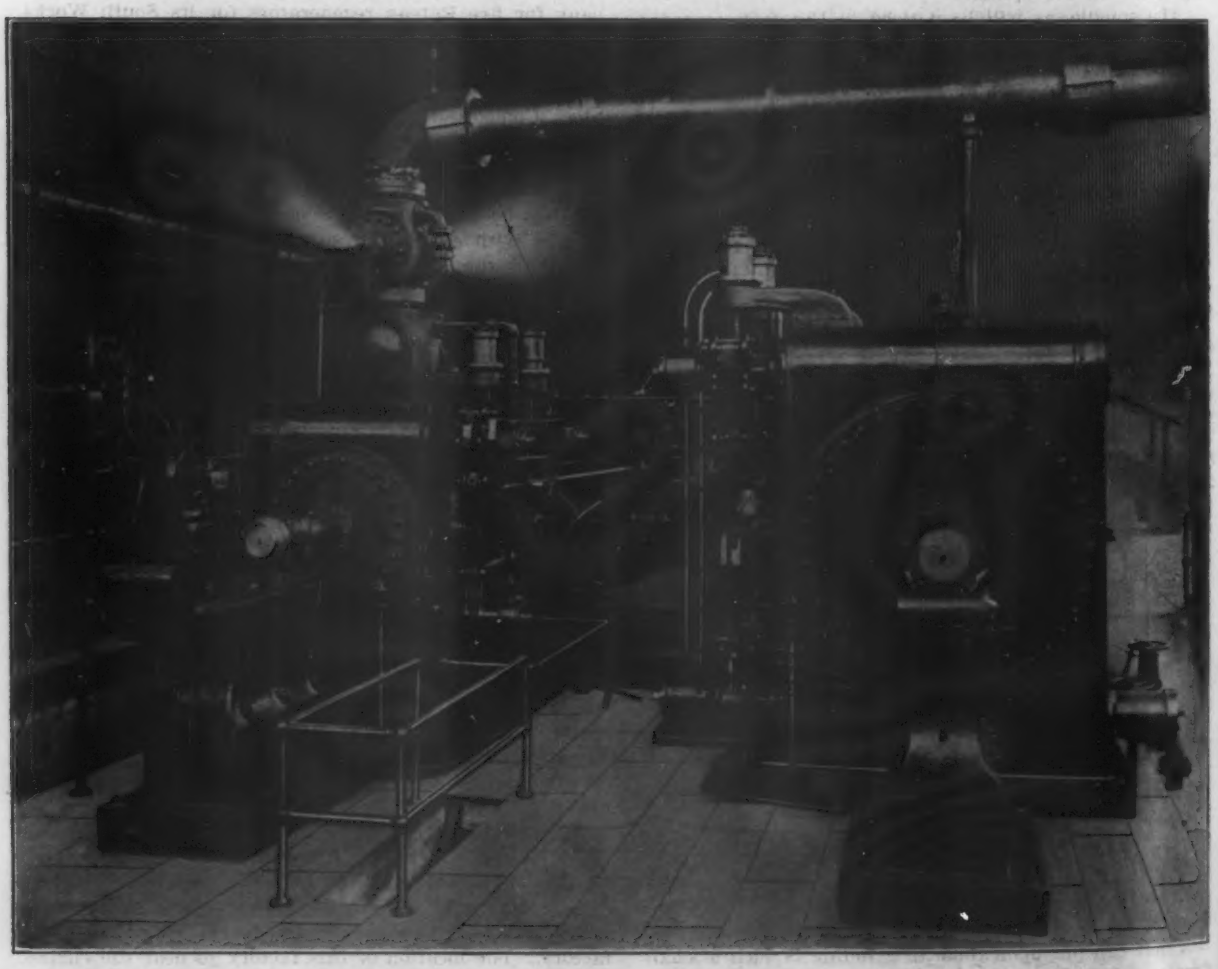


Fig. 7.—The Southwark Engine in the New Cambria Rod Mill.

The Autogenous Welding Company's High Duty Polishing Machine

A special design of buffing and polishing machine has been brought out by the Autogenous Welding Company ,73 Union Street, Worcester, Mass. The principal features of this machine, which is known as the No. 4 heavy duty polisher, are the use of ball bearings, economy of lubrication and freedom from repairs to journals and replacement of shafts. Fig. 1 is a view of the machine,

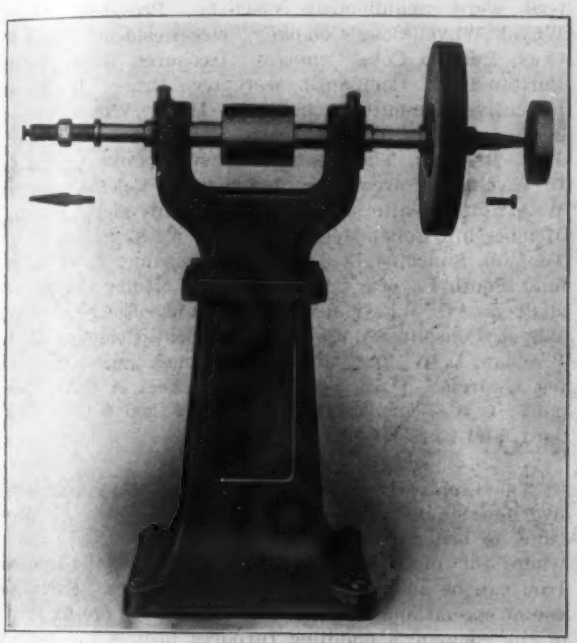


Fig. 1.—A Special Design of Buffing and Polishing Machine Built by the Autogenous Welding Company, Worcester, Mass.

while Fig 2 shows the details of the annular ball bearings used on the spindle.

The spindle, as will be noticed in Fig. 2, is mounted in annular ball bearings of the Hess-Bright type in place of the babbitt bearings, which are commonly supplied with this class of machinery. The special advantages of this type of bearing, as compared with the ordinary one, are freedom from wear, ample space for lubrication and a design of housing that prevents the entrance of abrasive material from the wheel. In an ordinary babbitt bearing it is difficult to prevent particles of abrasive material worn from the wheel from working their way into the bearing. These find their way into the lubri-

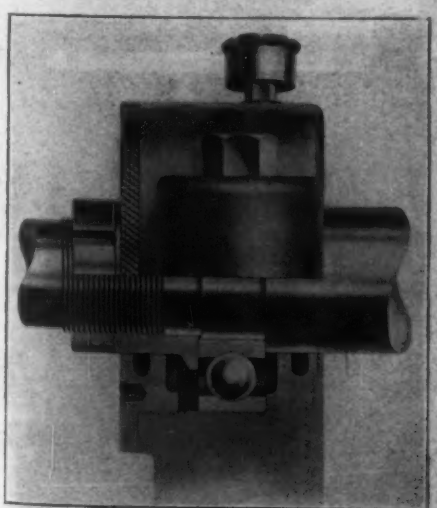


Fig. 2—Detail of the Spindle Bearing.

cating oil, and before long the bearing metal is cut and the shaft badly scored. Another advantage of the ball bearings is that they always run true, as the heaviest load that can put upon them in grinding is such a small fraction of their normal capacity that the matter of wear is negligible. The annular ball bearings on which the spindle of this machine is mounted are of the radial type, and their capacity for taking thrust is 25 per cent. of the radial load capacity. The wheel will run exactly true, and in the same plane, whether the grinding is being done against the edge or the side.

The bearings are packed with grease and fed from compression cups to keep them full. A slight overflow of this grease from the housing prevents any abrasive from getting into the bearing, as it is carried away by the grease. The amount of lubricant required to keep an annular ball bearing in good condition is very small.

The following table gives the principal specifications and dimensions of the machine:

Length of spindle, inches	39¼
Diameter of spindle in bearings, inches	1⅜
Diameter of spindle between flanges, inches	1½
Face width of spindle pulley, inches	5½
Diameter of spindle pulley, inches	5
Hight from floor to spindle center, inches	37
Speed of countershaft, revolutions per minute	600
Diameter of countershaft, inches	1 15/16
Length of countershaft, inches	36
Diameter of tight and loose pulleys, inches	10
Face width of tight and loose pulleys, inches	5
Diameter of drive pulleys, inches	18
Face width of drive pulleys, inches	5
Complete weight, pounds	550

This machine can be driven from an overhead countershaft or from one underneath the floor, as the pedestal is hollow, and enables the belt to pass through it.

Rateau Steam Regenerator Installations

The Rateau Steam Regenerator Company, New York City is installating five Rateau regenerators at the Ensley, Ala., plant of the Tennessee Coal, Iron & Railroad Company. The regenerators will deliver a constant flow of low pressure steam to three mixed flow steam turbines of 3000 kw. each. The exhaust steam supplied to the regenerators is provided by two reversing mill engines and one finishing mill engine. The company has also been awarded a contract by the Illinois Steel Company for five Rateau regenerators for its South Works, South Chicago, Ill. This equipment will handle the exhaust steam of the mill engines at this plant.

A complete plant at the works of the Lukens Iron & Steel Company, Coatesville, Pa., including a Rateau-Smoot turbine directly connected to a 900-kw. 250-volt direct current generator, running at 1500 rev. per min., complete condensing equipment and a steam regenerator, has been in continuous operation for the last five months with excellent results. There is now being installed at the French Worsted Company's plant, Woonsocket, R. I., an alternator of 800-kw. capacity driven by a mixed-flow Rateau-Smoot turbine, and all the condensing auxiliaries, and a Rateau regenerator.

The General Electric Company has received a non-exclusive right to equip the mixed flow turbines manufactured by it with the Rateau mixed flow regulator. The Rateau device allows a steam turbine to run on low pressure, high pressure or both simultaneously. The selection of the steam supply is automatic and does not affect the speed regulation of the turbine.

Railroad Equipment Orders.—The Pittsburgh & Lake Erie is reported in the market for 1,000 hopper and 1,000 steel gondola cars. The Rock Island, contrary to recent report, says it is not in the market for 1,450 freight cars. A Chicago dispatch announces contracts for 700 cars let by the Monon Railroad. The San Diego & Arizona is in the market for 120 freight cars and the Kansas City Southern for 125 ballast cars. The San Antonio & Aransas Pass is expected to buy box cars and stock cars and the St. Louis & San Francisco 11 postal cars.

The Charter Gas Engine Company, Sterling, Ill., had a narrow escape March 15, its plant having been in imminent danger from the burning of an adjacent keg factory. The location of this factory so near the engine works had been a menace for 40 years.

Bath Duplex Internal Grinders

Two Recently Developed Types Embodying Several Improvements

The double and single head duplex internal grinding machines of the Bath Grinder Company, Fitchburg, Mass., have recently had a number of improvements made in their construction. Complete descriptions of both of these machines have already appeared in *The Iron Age*, so that no extended description of their construction is necessary. The No. 2½, or single head, grinder was illustrated in *The Iron Age* May 30, 1907, and the double-head grinder was the subject of an illustrated description which appeared in the issue of September 30, 1909.

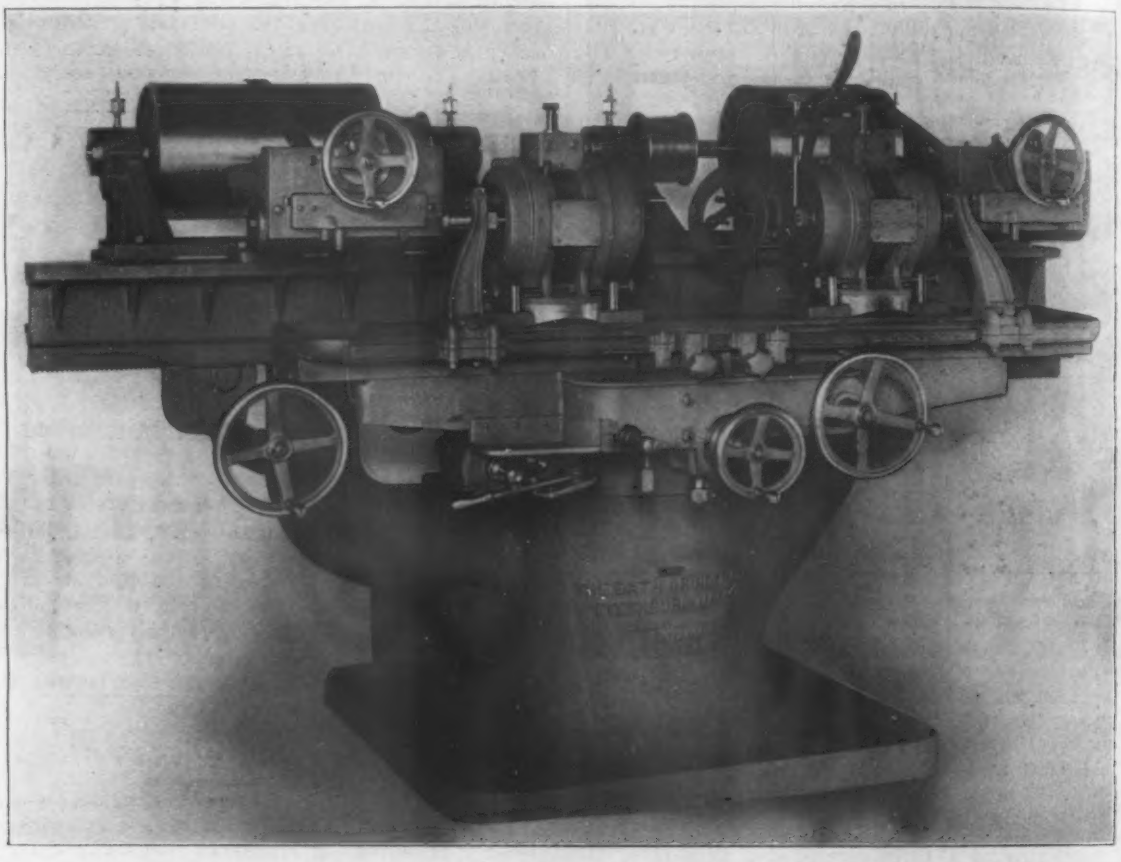


Fig. 1.—The Improved No. 5 Duplex Internal Grinder Built by the Bath Grinder Company, Fitchburg, Mass.

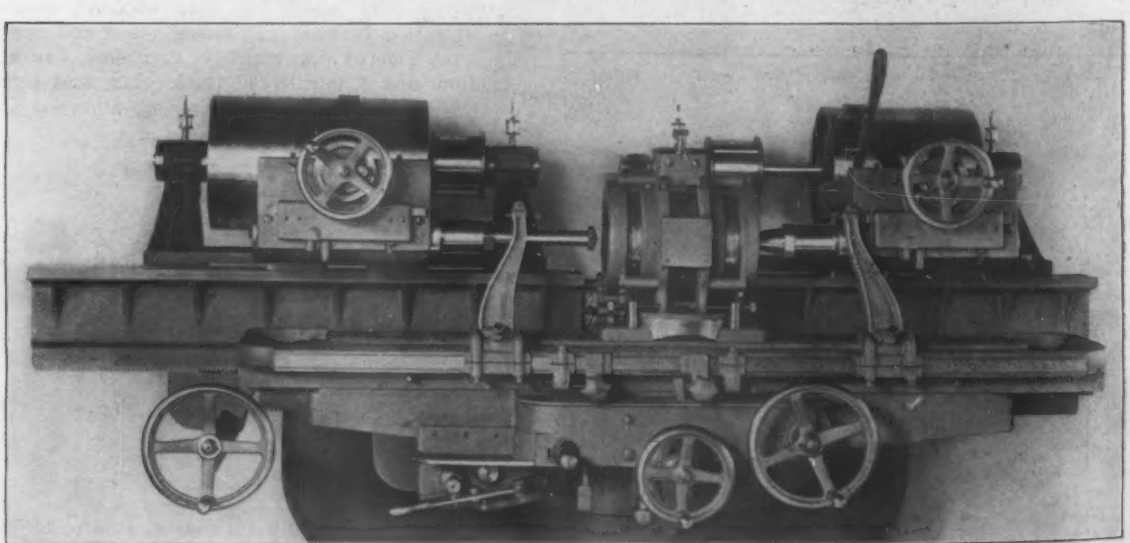


Fig. 2.—The Grinder Using Both Ends of a Special Headstock.

Fig. 1 shows the two-head machine, and Fig. 2 illustrates it with a special headstock furnished for grinding pneumatic hammers and long bearings. The various headstocks and chucks and the different types of internal manufacturing spindles furnished as a part of the equipment, are shown in Figs. 3 and 4, respectively. Fig. 5 is a view of the No. 2½, or single-head, grinder. Examples of work being done by these machines are given in Figs. 6, 7 and 8. The first shows a divided gear being ground on a gear hobber, while Figs. 7 and 8 are two views of the No. 2½ machine with face plate and universal chuck mounted on the headstock, and showing grinding being done from the front and the rear end, respectively.

The construction of these two machines is practically

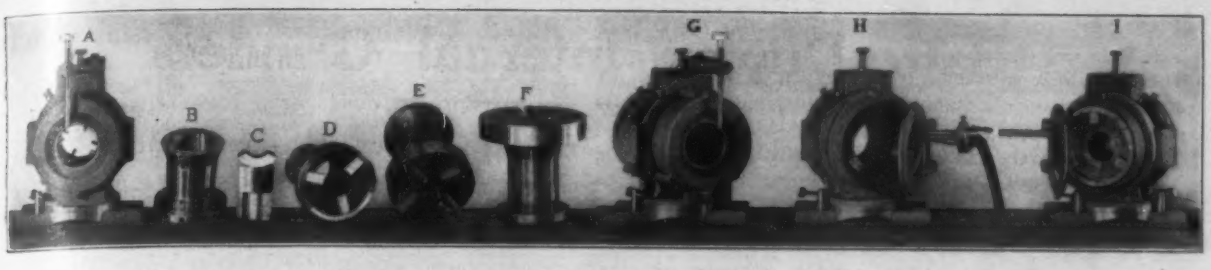


Fig. 3.—The Various Headstocks and Chucks Furnished.

the same, except that the one shown in Fig. 5 has only one spindle head instead of two, and the headstock construction is the same as that shown in Fig. 1, except that in the single-head machine a cross slide supports it. The special improvements made are in the construction of grinding spindle enters the hole from the rear end, as shown in Fig. 8. For truing the wheel or mounting or removing the work from the headstock, the water shield cover is removed, as in the headstock at the right of Fig 1. The single movement of swinging back the cover

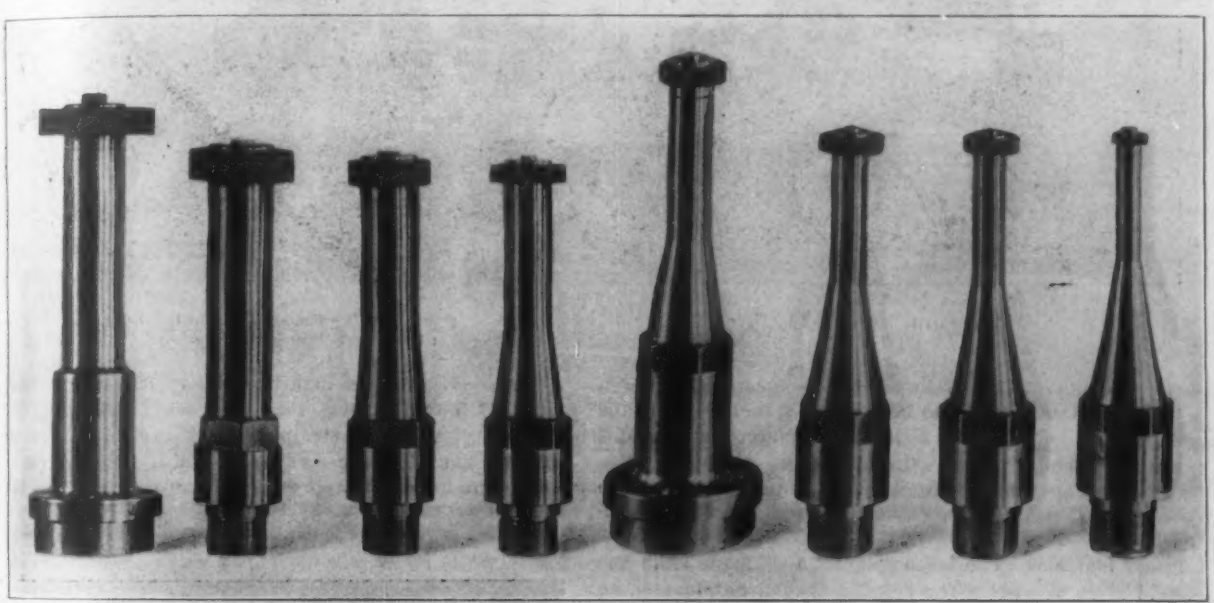


Fig. 4.—The Different Types of Internal Manufacturing Spindles.

headstock, the widening of the long reciprocating slide, making provision for carrying off the water used, and the furnishing of a three-fingered dog as part of the regular equipment. The headstocks swivel and are now arranged to grind taper as well as straight work. The is sufficient to cut off the water, as the supply pipe is connected with the cover and is thrown out of position when it is moved. It is claimed that using water with the swivel plate and mounting the headstock on the reciprocating slide, which has been widened, does away with vibration between the swivel plate and the joint. The three-fingered dog which is furnished, has a long, a medium and a short-faced tooth. The first serves to keep the wheel in the hole, the second allows it to pass

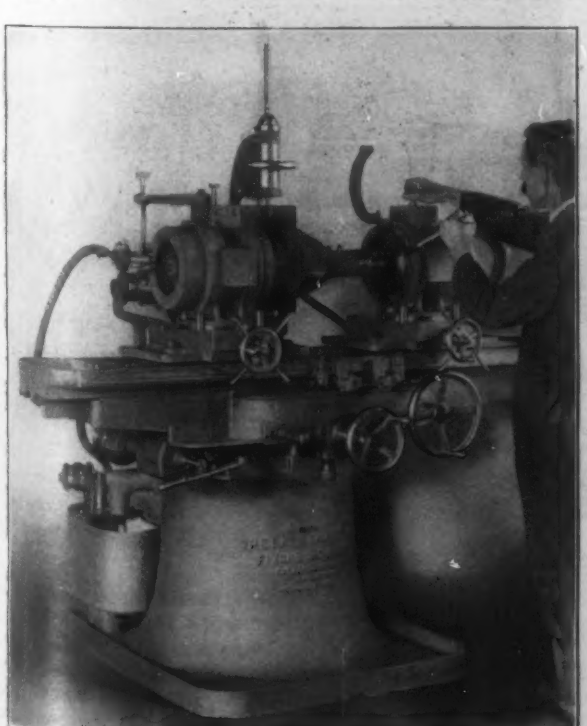


Fig. 5.—The No. 2½ Grinder.

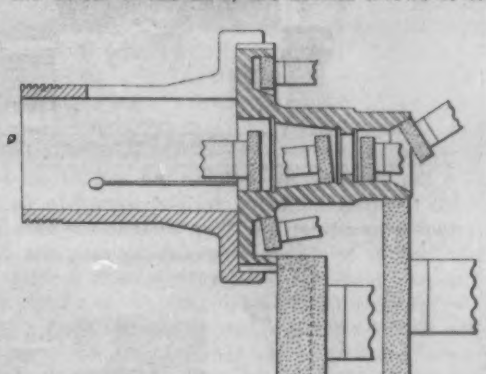


Fig. 6.—Grinding a Divided Gear on a Gear Hobber.

half-way out, and the last lets it entirely out, an arrangement which keeps the wheel grinding at all times and does away with the grinding of a bell mouth hole.

The advantage of the special headstock shown in Fig. 2, which is furnished for grinding pneumatic hammers and long bushings, is that two bearings can be ground at the same time concentrically with each other, or a coarse wheel can be used to rough the hole and a fine one to finish it. The various headstocks and the assort-

ment of work holding fixtures furnished with both machines are illustrated in Fig. 6. A is an end view of the headstock shown in Fig. 2 which is furnished for grinding pneumatic hammers and long bushings. B is a 4½-in. steel spring collet, while C is one of eight sets of reducing bushings furnished with the collet for reducing the hole to size. These reducing bushings can also be furnished with the stop spring chuck D, which has jaws for holding work that cannot be held inside of the spring chuck. E is a four-jaw independent chuck which is mounted on a quill and held in the spindle head in the same way as B or D. F is a face plate and H and I are the spindle heads with which the machines illustrated in Figs. 1 and 5 are equipped. In addition to these headstocks and chucks, eight sets of internal manufacturing spindles, as shown in Fig. 4, can be supplied for either machine. The large spindle A is made from one solid piece of steel. The spindle B can be mounted in a base plate like the one shown at E. Sixteen different diameters of spindles are made from 3-in. stock, and the ends are reduced to the diameter to be ground. This form of grinding spindle provides a large body of metal at the rear end, which absorbs the vibration of the spindle due to its high speed of operation and also the heat generated at the smaller end. These spindles are hardened, ground and lapped, and the bearings are made from Tobin bronze. There are no oil holes in the body of the spindles, but they are lubricated from the rear end and the machine does not have to be moved out of position to oil them.

The No. 2½ duplex internal grinder shown in Fig. 5 differs somewhat from the other machine, as it has only one spindle head with two spindles projecting from it, one on either side, and driven by one belt. The construction of the headstock is the same as in the other machine, except that it is mounted on the cross slides and operated by the cross screw pilot hand wheels. The dials on the cross screw indicate the work from size to size with the dial matching zero at zero. In this way it is possible to adjust the dials so that the zero points coincide, and it is simply necessary to read the desired size directly instead of subtracting one reading from another, which tends to admit error.

The use of eight grinding wheels to grind a divided gear on a hobber and the manner of holding the piece is illustrated in Fig. 6. In doing this work the gear is ground internally from the front and the rear ends simultaneously, the other parts being ground subsequently in separate operations. In Fig 7, the No. 2½ machine with face plate and universal chuck mounted in the headstock, is shown with the grinding spindles entering the work from the front end. In Fig 8 the headstock is reversed and the grinding is done from the rear end of the hole instead of the front.

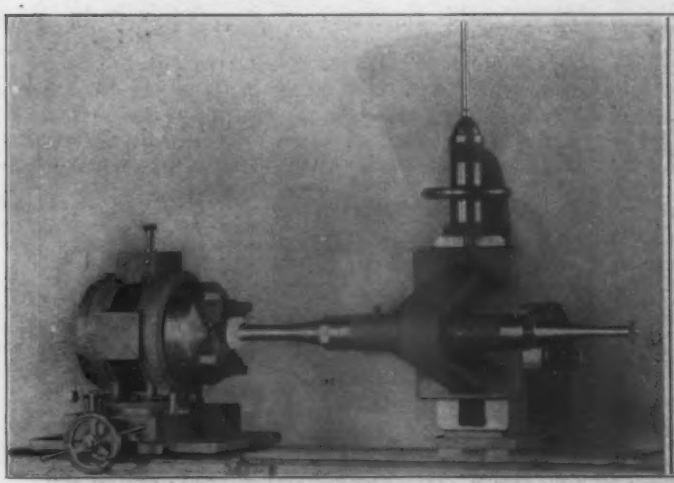


Fig. 7.—Grinding from the Front End.

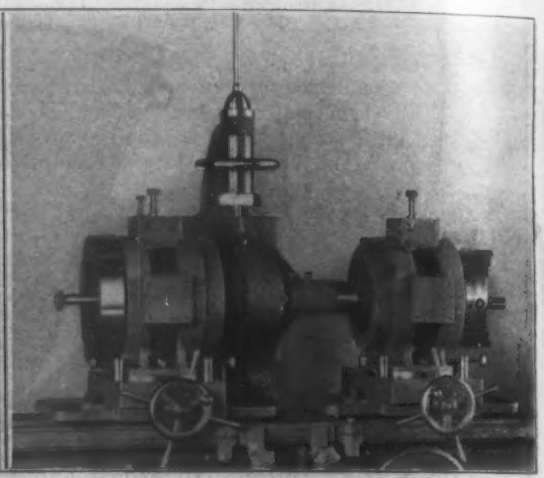


Fig. 8.—Grinding from the Rear End.

Two Views of the No. 2½ Machine with Face Plate and Universal Chuck Mounted in the Headstock.

The Bridgeport Malleable Iron Company, Bridgeport, Conn., emphatically denies the report of its proposed amalgamation with certain other companies manufacturing malleable castings.

Rapid Construction of a Mesta Blowing Engine

A record for rapid engine construction has been recently established by the Mesta Machine Company, Pittsburgh, Pa., at its works in West Homestead. The engine on which this rapid time was made is a special type of blowing unit and will be used by the Algoma Steel Company, Sault Ste. Marie, Canada, to furnish the blast for a Bessemer converter at a pressure of 32 lb. per square inch. It is of the long cross head heavy duty type, and the diameter of the steam cylinder is 46 in. The air cylinder has a diameter of 84 in. and a stroke of 60 in. The normal speed is approximately 40 rev. per min., but if desired a maximum of 60 rev. per min. can be secured.

In the engraving the engine is shown in the process of being unassembled for shipment from the builder's erecting floor. The order for this engine was placed on February 8 and the shipment was to be made in 30 days from the receipt of the order. Twenty-six days were, however, all that was required from the date the order was entered in the shop to build, assemble, take down and ship the engine.

A Large Blowing Engine Which Was Built in 26 Days by the Mesta Machine Company, Pittsburgh, Pa.

The Improved Berg Cinder Car

A New Type for Handling Blast Furnace Slag

The increasing use of mechanically dumped cinder cars for handling blast furnace slag has resulted in the further development of the P. T. Berg car, manufactured by the William B. Pollock Company, Youngstown, Ohio.

Fig. 1.—An Improved Berg Cinder Car Having a Capacity of 260 Cu. Ft. Built by the William B. Pollock Company, Youngstown, Ohio.

This car, which is of all steel construction and has a capacity of 260 cu. ft., was adopted for use at the Edgar Thompson furnaces as the result of a series of tests, and at the present time 70 of them are in service there. Fig. 1 is a general view of the car, Fig. 2 is a three-quarter view showing the mechanism for dumping the pot and Fig. 3 shows the pot completely tilted.

The car was designed with full appreciation of the severe use to which it would be subjected in service, and the construction embodies all the requirements which years of usage have suggested. The pot is made from a special analysis iron, and instead of being rigidly fixed to the trunnion ring, is secured by a lock which allows

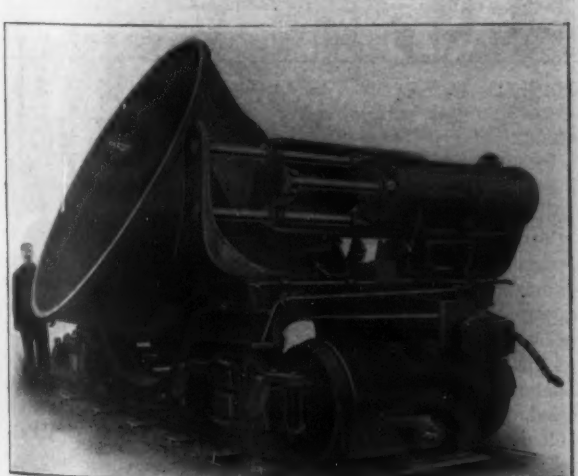


Fig. 2.—Three-Quarter View of the Car, Showing the Dumping Mechanism.

free expansion and contraction. In operation the pot is self-cleaning and the scull is ejected clear of the rail and the ties. The cars are equipped with M. C. B. trucks having a capacity of 100,000 lb., Schoen solid rolled steel wheels, Simplex bolsters, cast steel spring seats having a special design of cap to protect the springs, Westinghouse friction draft gear and automatic couplers with levers extending beyond the edge of the car body. Extra heavy steel castings which interlock so that no shearing strain is imposed on the bolts or rivets are used for the end and the side sections forming the car body.

Air or steam is used to dump the pot through a 16-in. cylinder, which has an eight-ring piston rigidly bolted to the front end frame. A long steel crosshead, which is shown in Fig. 2 together with the rest of the dumping mechanism, engages the front gear segment and rotates the steel trunnion ring and pot by a heavy steel connecting link. These gears travel to either side of the car on treads and racks which are bolted to the end frame. The entire dumping movement is automatically con-

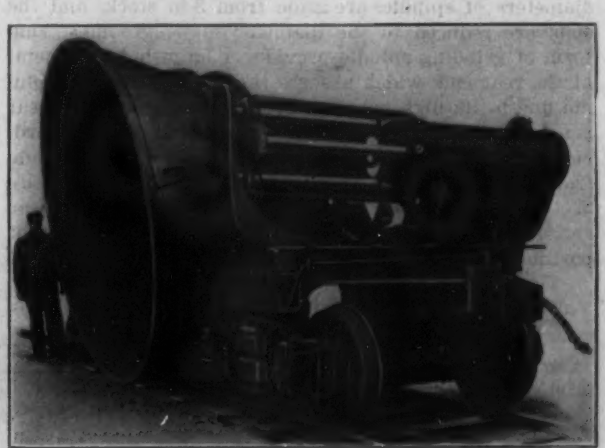


Fig. 3.—The Pot Completely Tilted.

trolled, and the speed at which the pot is tilted can be made as fast or as slow as may be desired.

The design of the cut-out cock on the train air or steam line, the operating valve and the lock is such that the rear end of the cylinder must be charged with air or steam to dump the receptacle. This air or steam forms a cushion and retards the speed of the piston in proportion to the rate at which this cushion exhausts through a regulating valve that is set and locked for a certain predetermined speed. An additional precaution against the tendency of a topheavy full cylinder pot to pull itself over rapidly is the use of elliptical gears. These maintain the center of gravity behind the vertical line of thrust on the treads and require the application of some force to push the pot over during the first half of the dumping operation, or until it is about half emptied and assumes the position shown in Fig. 2. This control of the

speed of dumping removes all danger resulting from a too rapid movement, and the return of the empty pot is also controlled in the same way, no shock being sustained by the car at the end of the stroke. An ordinary laborer or member of the train crew can dump and right the pot in less than a minute. The locking arrangement cannot be tampered with, and is so designed that it cannot be opened until power is applied from the locomotive, and it is also impossible to shut off the power after dumping until the lock is engaged and the pot securely locked in position for the next trip.

This car can also be used for handling open hearth furnace slag. When used for this purpose it is necessary to slightly modify the construction of the pot as well as add a lifting bail. A receptacle alongside the steel ladles contains the empty pots, and as these are filled they are lifted and placed in the car for transportation.

Data for Blast Furnace Piping

BY PAUL T. LESHER, HARRISBURG, PA.

The accompanying table has been computed to be used as a time saver both in actual design and in estimating. Its chief value will be in estimating, for when the required diameter of the piping is decided upon, then the weight of the steel work and brick lining, and the distance apart of the supports can be obtained at once from the table. The brick count gives the standard shapes contained in one linear foot and also their equivalent in 9-in. straights. The reason for giving the number of 9-in. straights is that the price of brick is usually given in terms of one thousand of this shape.

CHARACTER OF PIPING	MEAN DIAMETER OF PIPE	THICKNESS OF PLATE	THICKNESS OF LINING	WEIGHT OF PL. WK. PER LIN. FT. INCLUDING 6 % FOR LAP AND RIVETS			WEIGHT & CU. FT. OF LINING PER LIN. FT.		BRICK COUNT PER LIN. FT.			WEIGHT OF PIPING PER LIN. FT. PL. WK. & LINING			SECTION MODULUS OF PIPE (IN FEET) NOT DEDUCTING FOR RIVETS			MAX. DISTANCE BET. SUPPORTS FIBRE STRESS 12000 # DEDUCT FOR RIVETS			RIVETS						EDGE DISTANCE
																						DIAMETER			PITCH			
				1/4" PL.	5/16" PL.	3/8" PL.	LB.	CU. FT.	40 TO ARCH	9" ARCH	9" STR.	1/4" PL.	5/16" PL.	3/8" PL.	1/4" PL.	5/16" PL.	3/8" PL.	1/4" PL.	5/16" PL.	3/8" PL.	1/4" PL.	5/16" PL.	3/8" PL.	1/4" PL.	5/16" PL.	3/8" PL.			
HOT BLAST	48"	5/16"	9"		170.0		1149	7.66	63	84		130			1319			47.4			38			5/8"			2 1/4"			1 1/4"
" "	51"	5/16" 3/8"	9"		180.6	216.7	1237	8.25	48	108		140			1418	1454		53.5	64.3		39	43		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
" "	54"	5/16" 3/8"	9"		191.2	229.4	1325	8.84	35	132		150			1516	1554		60.0	72.1		40	44		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
" "	57"	5/16" 3/8"	9"		201.8	242.2	1413	9.43	21	156		160			1615	1655		66.9	80.3		41	45		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
" "	60"	5/16" 3/8"	9"		212.4	254.9	1501	10.02	14	168	5	170			1713	1756		74.0	89.0		42	46		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
" "	63"	5/16" 3/8"	9"		223.1	267.6	1589	10.61	7	180	10	180			1812	1857		81.7	98.1		43	47		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
" "	66"	5/16" 3/8"	9"		233.7	280.4	1678	11.19		192	15	190			1912	1968		89.5	107.5		44	48		5/8"	3/4"		2 1/4"	2 3/8"		1 1/4"
COLD BLAST	30"	1/4" 5/16"	—	84.9	106.2							85	106		14.8	16.6		35	35		7/8"	7/8"		2 1/8"	2 1/4"				1 1/4"
" "	33"	1/4" 5/16"	—	93.4	116.9							93	117		17.9	22.5		38	38		7/8"	7/8"		2 1/8"	2 1/4"				1 1/4"
" "	36"	5/16" 3/8"	—		127.5	152.9							128	153		26.7	32.1		40	40		7/8"	7/8"		2 1/4"	2 3/8"				1 1/4"
" "	39"	5/16" 3/8"	—		138.1	165.7							138	166		31.4	37.7		45	45		7/8"	7/8"		2 1/4"	2 3/8"				1 1/4"
" "	42"	5/16" 3/8"	—		148.7	178.4							149	178		36.3	43.7		50	50		7/8"	7/8"		2 1/4"	2 3/8"				1 1/4"
GAS MAIN	36"	1/4" 5/16"	4 1/2"	101.9	127.5		464	3.09	48	12		53	566	592		21.3	26.7		36	37		7/8"	7/8"		2 3/4"	3"				1 1/4"
" "	39"	1/4" 5/16"	4 1/2"	110.4	138.1		508	3.39	42	24		58	618	646		25.1	31.4		37	38		7/8"	7/8"		2 3/4"	3"				1 1/4"
" "	42"	1/4" 5/16"	4 1/2"	118.9	148.7		552	3.68	35	36		63	671	701		29.0	36.3		38	39		7/8"	7/8"		2 3/4"	3"				1 1/4"
" "	45"	5/16"	4 1/2"		159.3		596	3.98	28	48		68		755			41.8			40			7/8"			3"			1 1/4"
" "	48"	5/16"	4 1/2"		170.0		640	4.28	22	60		73		810			47.4			41			7/8"			3"			1 1/4"
" "	51"	5/16"	4 1/2"		180.6		684	4.57	14	72		78		865			53.5			42			7/8"			3"			1 1/4"
" "	54"	5/16"	4 1/2"		191.2		728	4.86	7	84		83		919			60.0			44			7/8"			3"			1 1/4"
" "	57"	5/16" 3/8"	4 1/2"		201.8	242.2	773	5.16		96		88		975			66.9	80.3		45	47		7/8"	7/8"		3"	3"		1 1/4"
" "	60"	5/16" 3/8"	4 1/2"		212.4	254.9	817	5.45		96	5	93		1029	1072		74.0	89.0		47	49		7/8"	7/8"		3"	3"		1 1/4"
" "	63"	5/16" 3/8"	4 1/2"		223.1	267.6	861	5.74		96	10	98		1084	1129		81.7	98.1		50	52		7/8"	7/8"		3"	3"		1 1/4"
" "	66"	5/16" 3/8"	4 1/2"		233.7	280.4	906	6.04		96	15	103		1140	1186		89.5	107.5		53	55		7/8"	7/8"		3"	3"		1 1/4"
" "	69"	5/16" 3/8"	4 1/2"		244.3	293.2	950	6.33		96	20	108		1194	1243		97.9	117.5		55	58		7/8"	7/8"		3"	3"		1 1/4"
" "	72"	5/16" 3/8"	4 1/2"		254.9	305.9	994	6.63		96	25	113		1249	1300		107.0	128.0		58	60		7/8"	7/8"		3"	3"		1 1/4"
" "	75"	5/16" 3/8"	4 1/2"		265.6	318.6	1038	6.92		96	30	118		1304	1357		115.7	139.0		60	60		7/8"	7/8"		3"	3"		1 1/4"
" "	78"	5/16" 3/8"	4 1/2"		276.2	331.4	1082	7.22		96	35	123		1358	1413		125.0	150.0		60	60		7/8"	7/8"		3"	3"		1 1/4"
" "	81"	5/16" 3/8"	4 1/2"		286.8	344.1	1126	7.52		96	40	128		1413	1470		134.7	161.8		60	60		7/8"	7/8"		3"	3"		1 1/4"

General Data for Blast Furnace Piping.

In calculating the maximum distance between supports, a fibre stress of 12,000 lb. per square inch has been used, and a rivet efficiency assumed of 50 per cent.

The figures given under the heading "Maximum Distance Between Supports" are not the maximum distance between supports obtained when figured in regard to the section modulus of the pipe, as they are somewhat shorter, but are spans that for practical purposes should not be exceeded, as piping around steel works is sometimes subjected to strains that were not taken account of, such as arise, for example, from riggers hitching a rope around the pipe.

The section stipulated for gas mains can also be used for piping which conveys gas from gas producers.

The Passaic Steel Works, Paterson, N. J., will shortly be organized and refinanced. The statement is made that since the committee of bondholders bought the plant it has been operated at such a satisfactory profit that the conditions seem favorable for making arrangements to put it on a proper basis. It is understood that the committee proposes to issue $500,000 in stock and $300,000 in bonds.

The Chicago Metal Trades Annual Meeting

The Chicago Branch of the National Metal Trades Association held its thirteenth annual dinner and meeting at the Mid-day Club on the evening of March 4. About 125 members, representing Chicago's industries, were present when dinner was served. President O'Leary called the session to order at eight o'clock and in a brief address reviewed the work of the year and extended his appreciation to co-workers who had helped to make it so beneficial.

Interesting reports were submitted from Secretary Paul Blatchford, Treasurer L. C. Walker, and Manager of Employment Bureau R. W. Closter. The Chicago Branch has gained slightly in membership during the past year and its finances are healthier than a year ago. Among other interesting items in the report of the Bureau of Employment was the statement that 6,663 men had registered and 6,271 had been assigned positions in the various shops of the members. This report, taking into consideration the somewhat stagnant condition of the past year, shows wonderful activity and the value of this department. Even during the somewhat quiet year just passed, as much difficulty was experienced in securing skilled mechanics as in most prosperous times. Mr. Closter believes this is due to the seeming unsettled conditions in the machinery industry which have forced many of the more intelligent and efficient mechanics into other lines where they have qualified for more lucrative positions. Secretary Blatchford closed his report with a strong recommendation that the members lend their hearty support and co-operation to the men in charge of the Lewis Institute where apprentices are being educated.

H. B. Shieve, president of the Superintendents' and Foremen's Club, brought greetings from that body and expressed the hope that closer relations be cultivated between it and the Chicago Branch, at the same time extending a hearty invitation to the members of the Chicago Metal Trades Association to visit his club at some of its regular meetings.

The following officers and committeemen were elected for the ensuing year: President, N. W. Ding-

wall, Chicago Drop Forge Company; vice-president, W. L. Kroeschell, Kroeschell Bros. Company; treasurer, O. A. Olson, Simonds Mfg. Company. Executive Committee. N. W. Dingwall, Chicago Drop Forge Company; W. L. Kroeschell, O. A. Olson, H. H. Latham, Latham Machinery Company; John W. O'Leary, A. J. O'Leary & Son Company; L. C. Walker, Aermotor Company; Francis S. North, Union Special Machine Company; Staunton B. Peck, Link-Belt Company; Louis E. Burr, Woods Motor Vehicle Company.

Harry L. Wheeler, president of the Chicago Association of Commerce, was introduced as the speaker of the evening and his subject "Chicago, the Great Central Market, and the Metal Trades Industry" could hardly have been handled in a more able or interesting manner. Reviewing the history of Chicago from the time 80 years ago, when it was but an uninhabited marsh, up to the present day with its two and a quarter million population, Mr. Wheeler brought vividly before his hearers some of the many phases of this rapid development, which was traced directly to individual effort. The members of the metal trades industry were earnestly solicited to put their shoulders to the wheel that will make the Chicago of to-morrow a better market and a better town than it is to-day. The advantages of competition as an attraction to buyers were dwelt upon at some length and it was held as one of the principal reasons for Chicago's rapid strides. Jesse Holdom, for many years a judge of the Superior Court of Cook County, was the next speaker, and his subject, "Injunctions," was handled in a most pleasing and instructive manner by this dry humorist. He advocates the judicious use of an injunction and stated that its abuse generally came from haste in its use. Practical examples familiar to every one present were used to show the advantages of going slowly with injunctions. Frank C. Caldwell, first vice-president of the National Metal Trades Association, and former president of the Chicago Branch, spoke on "Our Associations." He has recently visited a number of the Eastern branches and his address was of a most practical nature. The Chicago Branch will probably meet more often the coming year than in the past.

Hoists for Foundry and Shop*

BY H. PRAKKEN.†

The hoist has been perfected to such a degree that its use is not confined to lifting loads of iron, but for hoisting the finest and most carefully made molds satisfactorily. Previous to the era of the electric motor, eliminating the hydraulic hoist, the old windlass was the machine in most common use for lifting purposes followed by the block and pulley, the triplex block or planetary gears with a hand hoisting device and the motor attached to the triplex block to eliminate the hand hoisting. In the designing and manufacturing of the modern hoists manufacturers had to overcome many difficulties both electrical and mechanical.

One of the essential features in a hoist for its satisfactory operation is the certainty with which the cable can be wound and unwound on and off the drum at low and high speeds. Many a hoist upon the market to-day has a low efficiency due to the design of its parts. The efficiency of the worm geared hoist varies from 45 to 80 per cent., depending upon the pitch of the worm screw and its length of service.

As the hoist while operating is often exposed to the weather, it should be weatherproofed. This is accomplished by making machined joints between the bearing and the end bracket of the motor, by treating the magnetic brake coils with weatherproof compounds and by copper plating the plungers of magnetic brakes when the last are used. All openings in the motor frame or controller through which water might penetrate should be closed up. This method of construction and treatment will prevent the elements from corroding the exposed parts.

A hoist for foundry work should have incorporated within its mechanism an upper and lower limit device, and either a mechanical or magnetic brake for cutting off the power. When the load reaches either of the extreme points the limit device will throw off these contacts under which it has just been operating and arrange the contact for making an operation opposite to the previous one. As the controller is shut off, the brake is applied by a spring to the pulley on the shaft of the motor. The armature, therefore, can only be turned to either the hoisting or the lowering point.

The average power required by four 5-ton air hoists having a hoisting speed of 15 ft. per minute was 39.7 hp., as compared with 9 hp. for an electric hoist of the same capacity and speed. The power for the air hoists represents the amount which has to be generated at the compressor to compensate for the line loss and leakage, while the electrical horsepower is that required at the hoist.

In an air installation where many tools and hoists are in operation the pressure varies at different parts of the line much more than it would when using an electrical supply. This variation results at times in a sudden raising of the load where the latter is balanced on a cylinder hoist, causing damage to the load where it is a mold in a foundry. As holding the load at any point by the electric hoist is not accomplished by a balance of pressure, or by a stroke, the advantage of the latter is obvious where delicate molds or hot metal are handled.

The selection and control of hoists in foundries is a subject offering almost as many diversities as there are different shops. The variety of hoists for this work has finally narrowed down to the air and the electric types except where the hydraulic hoist may be installed for very heavy work. The air hoist when in proper working order is ideal for foundry use as far as speed control is concerned, with a range from a hardly perceptible speed to one as rapid as desired. The prime result to be attained in a foundry control is slow speed at all loads, high speed being only of secondary importance except in special cases where the class of work may demand a very high ultimate speed, as well as a very slow initial one, and, generally speaking, the former should decrease as the capacity of the hoist increases. For instance, a 1-ton hoist might have an ultimate speed at full load of 20 ft. per minute, while a 1½-ton hoist need not exceed 15 ft. per minute, and a 2-ton hoist might be as slow as 10 ft. per minute, without in any way affecting the output of the gang working under it, as the higher capacity hoist usually indicates larger and more difficult work. Very good control can be obtained from one-quarter to full load, which will eliminate the necessity of the molder trying for a notch on the controller, which will lift at a slow speed any load that he may have on the hook. The proper foundry control should permit the lifting of any load up to and including full load at a desirably slow speed on the first notch of the controller.

* Abstracted from a paper presented at the meeting of the Chicago Foundry Foremen's Association, March 16, 1911.
† Sprague Electric Company, Chicago, Ill.

The General Fireproofing Company, Youngstown, Ohio, announces that owing to the remarkable growth in its all steel furniture and Herringbone metal lath business, it has sold its entire bar and fabricated beam reinforcement business to the General Reinforcement Company, Youngstown, Ohio. This move has been made to gain necessary additional manufacturing facilities which will permit specializing along the metal lath and furniture lines in which the General Fireproofing Company is a pioneer.

Waddill Catchings, receiver of the Central Foundry Company, 90 West street, New York, announces that the published adjudication in bankruptcy of that company and the proposed meeting of creditors do not interrupt the continuance of the business, simply being steps toward the carrying out of the reorganization, now rapidly progressing, under which the business and property are to be freed from the bankruptcy court. It is expected that the reorganization will shortly be completed. Meanwhile orders will be received and filled as heretofore.

BLEICHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

The Almond Tool Holder

A Universal Tool Set for Lathes, Planers and Shapers

In a set consisting of a single holder and 13 or 15 tools, the T. R. Almond Mfg. Company, Ashburnham, Mass., is offering a new tool equipment covering practically all the requirements for lathes, planers and shapers of moderate size. Compared with single purpose holders it has a much greater range of application, and the shapes required for the tools are more readily obtainable than those for most multi-purpose holders. The holder is not only capable of holding a variety of tools but will hold them in any one of five different positions. Two of these positions are shown in Fig. 1, where the holder in one case is set up with a side tool in the right-hand off-set position, and in the other with a turning tool in the left-hand off-set position. In this view are also shown the unassembled parts of the holder. It will be seen to consist of but four parts, the shank, bolt, clamp and nut. The end of the shank is formed with octagonal faces against five of which the five different positions are obtained. Between the beveled or dovetailed faces on the head of the bolt and the clamp, the different tools are secured and the clamping action causes the side of the tool to bind against one of the octagonal faces of the shank to hold it rigidly. The octagonal faces on the head of the bolt, fitting against the shoulder of the shank, further add to the rigidity. One of the principal advantages of the holder is that it leaves the tool exposed on the cutting side, giving an open face that allows working up into shoulders and in corners of irregular work without interference of the tool or holder.

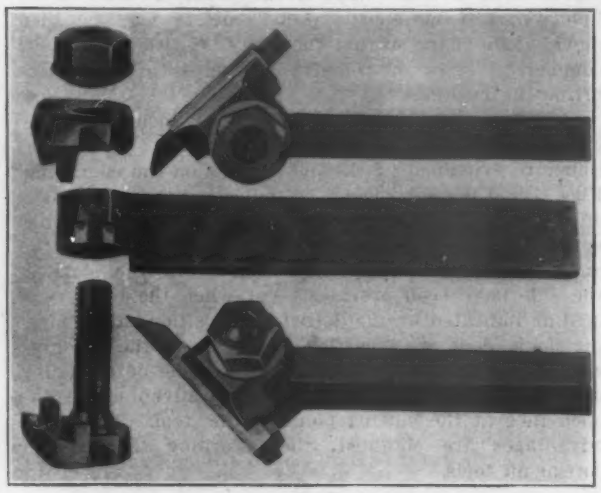


Fig. 1.—The Tool Holder Made by the T. R. Almond Mfg. Company, Ashburnham, Mass., Showing the Unassembled Parts and the Holder Made Up as a Right-Hand Offset Side Tool and a Left-Hand Offset Turning Tool Using a Bushing.

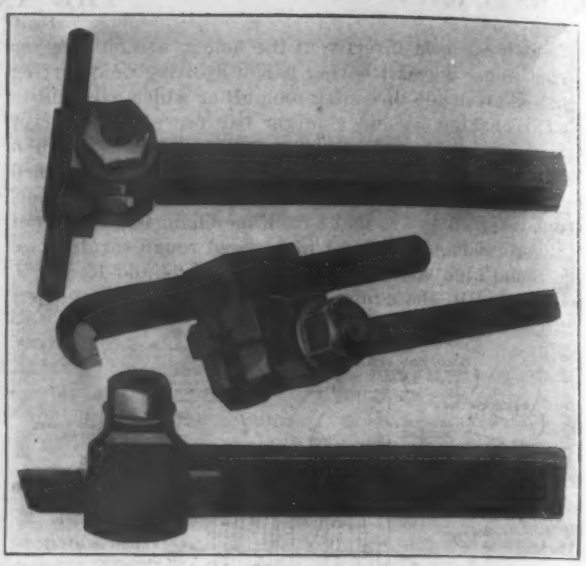


Fig. 3.—The Spotting or Centering Tool in the Straight-Across-the-Front Position, the Large Boring Bar in Left-Hand Side Position, and a Threading Tool in the Right-Hand Side Position.

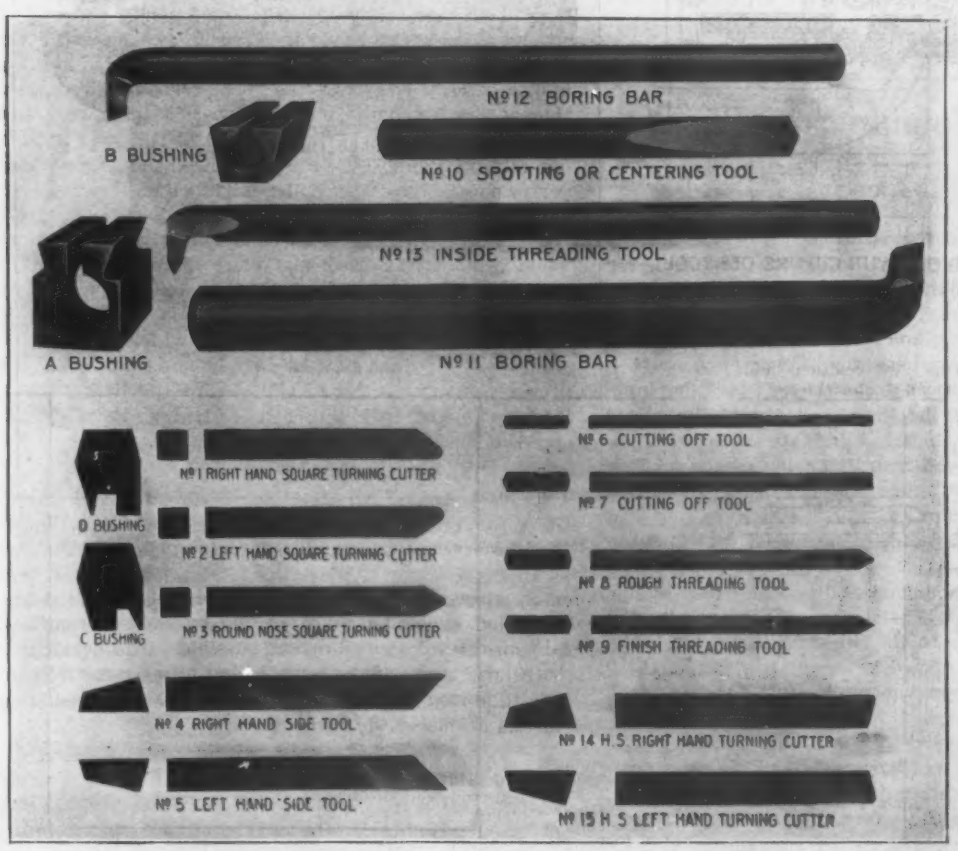

№12 BORING BAR
B BUSHING
№10 SPOTTING OR CENTERING TOOL
№13 INSIDE THREADING TOOL
A BUSHING
№11 BORING BAR
№1 RIGHT HAND SQUARE TURNING CUTTER
D BUSHING
№2 LEFT HAND SQUARE TURNING CUTTER
C BUSHING
№3 ROUND NOSE SQUARE TURNING CUTTER
№4 RIGHT HAND SIDE TOOL
№5 LEFT HAND SIDE TOOL
№6 CUTTING OFF TOOL
№7 CUTTING OFF TOOL
№8 ROUGH THREADING TOOL
№9 FINISH THREADING TOOL
№14 H.S. RIGHT HAND TURNING CUTTER
№15 H.S. LEFT HAND TURNING CUTTER

Fig. 2.—The Tools and Bushings Furnished with the Almond Tool Holder.

The tools, or the bushings in which they are held, as the case may be, have beveled faces to correspond with the dovetail recess formed between the bolthead and the clamp. The bushings just referred to are such as are used to secure square or round tools in the holder, and may be seen in Fig. 2, which shows the tools furnished with the holder. These will be seen to consist of right-hand, left-hand and round nose square turning cutters, which, according to the side of the holder on which they are used, are clamped in either bushing C or D; right and left hand side tools, narrow and wide cutting-off tools, rough and finish threading tools, all

of which are held directly in the holder without the use of bushings; a small boring bar, a spotting or centering tool and an inside threading tool, all of which are held in a split bushing B, and a larger bar for which a larger bushing, A, is furnished. The bushings are of such a nature that the tools, when placed in them and assembled in the holder, are clamped on all sides. All of the tools above referred to are made from merchant bar stock, but it is recommended that for high speed rough turning two additional high speed steel cutters, Nos. 14 and 15, Fig. 2, be included in the equipment. These are right and left

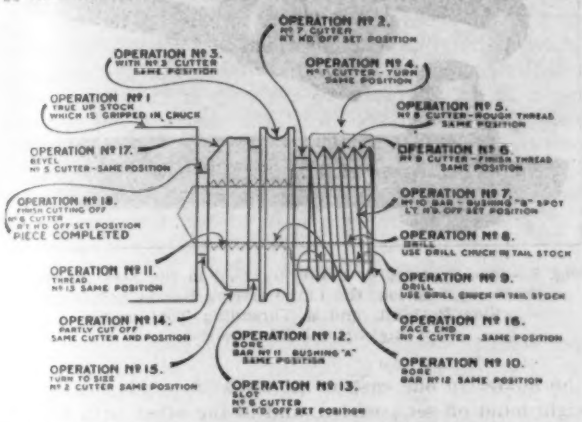


Fig. 4.—A Job Completed with the Almond Tool Holder, Using Practically Every Cutter in the Set.

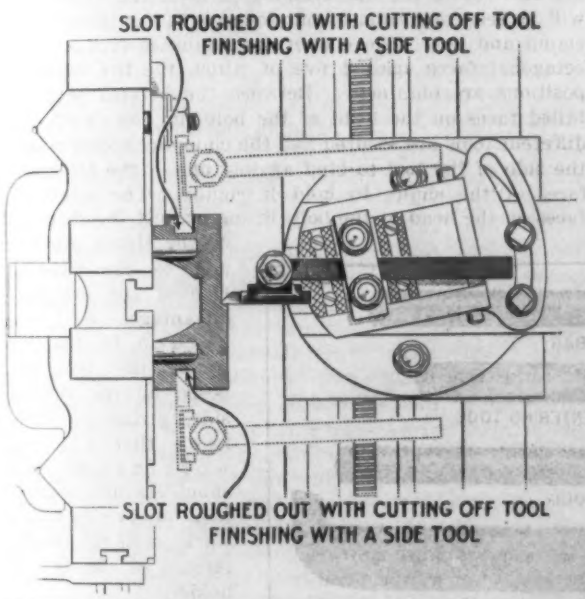

SLOT ROUGHED OUT WITH CUTTING OFF TOOL
FINISHING WITH A SIDE TOOL
SLOT ROUGHED OUT WITH CUTTING OFF TOOL
FINISHING WITH A SIDE TOOL

Fig. 5.—A Planer Job Involving Two Positions and Three Cutters of the Almond Tool Holder.

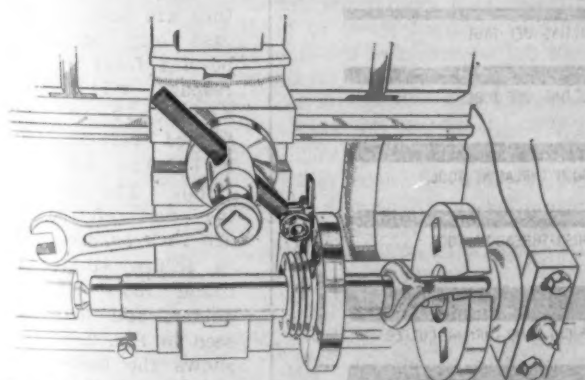


Fig. 6.—Threading Close to a Shoulder with the Almond Tool Holder.

hand turning cutters, and are made similar to the right and left hand side tools, but with the cutting points ground curved and with top rake. This design of cutter gives ¾ in. of metal to back up the cutting point and take away the excessive heat due to high speed work.

The use of the bushings is indicated in the instance of the left-hand off-set turning tool assembly as shown in Fig. 1 and the spotting tool and large boring bar assemblies in Fig. 3. Between Figs. 1 and 3 may be seen all of the five adjustments of the holder, namely, right and left hand side positions, right and left hand off-set positions, and the straight-across-the-front position. It is preferred that the last named position be used only where the cut is to be a light one, as in that position the cutting thrust exerts a torsional moment on the shank and the hold in the tool post depends entirely on the set screw. Any style or shape of cutter may be held in the holder and if necessary special cutters may be filed quickly into shape so that they may be used directly, or commercial sizes of rounds or squares are available fitting the bushings.

Fig. 4 shows a piece of work upon which practically every cutter in the complete set is required. The operations are explained by the inscriptions on the engraving. Figs. 5 and 6 are typical jobs indicating the advantages of the holder. Fig. 5 shows a planer job where the holder is being used with a turning tool to plane across the top and with the same setting of the work the slots in the side have been previously cut when the tools were held as indicated by the dotted line positions, the roughing being done with cutting-off tools and the finishing with side tools. Fig. 6 shows an example of threading up close to a shoulder indicating the advantage of the open face at the cutting point of the tool. The same advantages are obtained when working the side or cutting-off tools.

The New Springfield Dry Grinder

A new direct connected motor driven dry grinder is being built by the Springfield Mfg. Company, Bridgeport,

A New Direct Connected Motor Driven Grinder Built by the Springfield Mfg. Company, Bridgeport, Conn.

Conn., in three sizes. The motor is practically entirely inclosed and is mounted on a very heavy and substantial base to absorb all the vibration possible. The bearings are both large and long and run in self-oiling boxes.

The following table gives the principal dimensions and specifications of the three sizes:

	BM	CM	DM
Diameter of grinding wheels, inches	12	18	24
Thickness of grinding wheels, inches	2	3	3
Distance between wheels, inches	35½	38½	43½
Hight of spindle center from floor, inches	36	36	36
Length of spindle, inches	45	48½	57
Length of bearing, inches	10	11	12
Diameter of spindle in bearings, inches	1½	1¾	2¼
Diameter of spindle between flanges, inches	1¼	1½	2
Size of motor, horsepower	2	3	5
Floor space, inches	21 x 45	24 x 48½	26 x 57
Weight of complete machine, pounds	1,050	1,400	2,000

The grinders can be furnished with or without safety hoods, as may be desired, and wheels having a greater face width can also be accommodated when the hoods are not used.

White Irons and the Prevention of Growth in Castings

Prof. H. C. H. Carpenter delivered an address on "The Growth of Cast Iron" at a meeting of the Birmingham Metallurgical Society and the Birmingham branch of the British Foundrymen's Association, held at Birmingham, Eng., February 24. His discussion of the subject was in part on the lines followed in the paper prepared by Prof. H. F. Rugan and Professor Carpenter for the autumn meeting of the Iron and Steel Institute in London in 1909. A synopsis of this paper was given in *The Iron Age* of October 7, 1909, page 1086. In connection with it was printed a comment from A. E. Outerbridge, Jr., Philadelphia, who was the first to call attention publicly to the increase in the volume of cast iron after repeated heatings. Mr. Outerbridge advanced the explanation that this change in volume is a molecular and not a chemical one. Professors Rugan and Carpenter took issue with him on this point; also with his statement there was no increase in weight through the repeated heatings of gray cast iron.

Professor Carpenter's recent address at Birmingham, in which he gave the results of his further experiments with cast iron, shows that he agrees in part with Mr. Outerbridge on one point on which issue was taken with the latter in the Rugan-Carpenter paper. In that paper the authors said:

> The author's experimental results with these two alloys (A. and M.—white irons) are in disagreement with his (Mr. Outerbridge's) opinion that "white iron in which nearly all of the carbon is in the combined form does not expand sufficiently to overcome the original shrinkage, even after all of the combined carbon has been changed to graphite"; and conclusively show that it does.

In the report of Professor Carpenter's Birmingham address, given in the London *Ironmonger* of March 4, 1911, the following appears:

> Manganese exerts an important influence on iron, as is shown in the white irons; it keeps the carbon in the combined state, it makes it stable and prevents the deposition of temper carbon. It also makes carbon irons tougher and less brittle. He (the speaker) had been able to prepare white irons containing a considerable amount of manganese which, while not as fusible as ordinary gray iron, are very much more fusible than mild steel, and which possess a further valuable property in that they do not deteriorate by repeated heating but rather improve in their mechanical qualities, particularly as regards their tenacity. Irons made according to his specification after being heated for four hours at 900 degrees C. 150 times had not only not grown, but had contracted—from ½ to 1 per cent.

It would seem, therefore, that Professor Carpenter's experiments with white iron have brought him to the same conclusion originally reached by Mr. Outerbridge, though Professor Carpenter confines it to white iron containing a considerable percentage of manganese. In fact, Mr. Outerbridge, in commenting upon the Rugan-Carpenter paper, showed that the authors' own tables of expansion of the white iron series A and M proved that the bars did not expand sufficiently to overcome the original shrinkage.

In discussing the subject at Birmingham, Professor Carpenter called attention to the practical value of some means of preventing the growth of cast iron. One remedy he suggested for the difficulty was the employment of white iron. On a former occasion he had suggested the use of iron containing about 3 per cent. carbon, low silicon and small quantities of other elements, but it had been held that that material was still unsuitable for ingot molds for steel works. He did not think it possible so to treat a gray iron that it would not grow. Mild steel, on the other hand, is too expensive. An iron must be used with sufficient carbon to be fusible, yet not high enough in carbon to deposit temper carbon on heating. It must not be brittle. After working on the problem for 18 months he believed he had solved it. He was not in position, he said, to explain the details, but would give these in a paper to be prepared for the May meeting of the Iron and Steel Institute. He was willing to say that the solution of the problem turned on the quantity of manganese present in the alloy.

Advantages of Long Stroke Motors for Commercial Vehicles *

Opinions differ as to the proper length of stroke for automobile and motor truck engines. An engine having a cylinder 11 in. in diameter and a stroke of 15 in., built 15 years ago, was recently superseded by one in which the dimensions were 10 and 18 in., respectively. This engine weighed about 1500 lb. less than the former one and was built for 25 hp. at a speed of 265 rev. per min. or a piston speed of 795 ft. per minute. A thorough test showed that this engine would develop 40 hp. on a smaller fuel consumption than the earlier one would develop 22 hp. and that the efficiency of the newer engine continued to increase until the piston speed reached 850 ft. per minute.

The advantages of the long stroke over a short one in an engine are less weight for a given horsepower, longer life, greater fuel economy, need of less radiating surface, smoother running and less noise. A 4 x 4 in. motor of modern construction if made 4 x 5½ in. will have as long life and an increase in power of from 25 to 35 per cent. at the same speed with an increase of only 5 to 10 per cent. in weight. Increasing the piston speed of a short stroke motor to that of a long stroke motor will not have the same effect for more power will be required to drive the motor itself. A long stroke motor of a given horsepower has a smaller cylinder diameter and as the initial pressure per square inch on the piston head is practically the same in either type of construction, the total pressure on the head and the shock caused by the quick expansion of the gases at the beginning of the stroke will be less in the smaller diameter motor.

Practically all the parts in the short stroke motor except the piston must move faster and this together with the greater number of reversals of direction of reciprocating parts per unit of time gives more wear.

The heat units from the fuel are expended in frictional losses, radiation losses, exhaust losses and useful power. In a short stroke engine the friction loss is greater on account of the greater number of strokes for the same piston speed and the radiation losses are greater due to the larger amount of exposed wall surface in the compression chamber. With the longer stroke motor the compression can be increased over that of the short stroke type without any of the bad effects or disadvantages of too high compression. The more gases are expanded the less the heat which will be carried off through the exhaust and in a long stroke motor the pressure of the exhaust gases will be lower. Smoother running and less noise are secured in a long stroke motor as the number of revolutions for the same piston speed is less than in a short stroke motor and the noise must necessarily be increased when the motor is running at a greater number of revolutions on account of the increased speed of opening and closing valves and the movement of the other parts of the motor.

The proper ratio of stroke to bore depends upon the work for which the motor is to be used, and the best practice is to use the longest stroke possible consistent with a smooth running engine for stationary work and where the speed varies to have the stroke such that the piston speed will be at a point showing the greatest efficiency at the number of revolutions per minute at which the motor is most commonly used.

The Empire Iron & Steel Company, manufacturer of black and galvanized sheets, Niles, Ohio, has been authorized by the stockholders, at a meeting held March 9, to increase its capital stock from $200,000 to $1,000,000. Statements which have appeared in the press referring to this company as an auxiliary to the Garry Iron & Steel Company are wholly incorrect, the Empire Company being an independent corporation. The officers are as follows: President, George D. Wick; vice-president, Samuel Siddall; treasurer, J. D. Waddell; secretary, P. H. Hubbard, and assistant secretary, D. W. Kerr.

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* Abstract of a paper read at the January meeting of the Society of Automobile Engineers, New York City, by Edward A. Myers of the Model Gas Engine Works, Auburn, Ind.

New Tools and Appliances

This is essentially a news department for which information is invited.

Duplex Vertical Miller.—The Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., has recently designed and built a large duplex type of vertical milling machine for use in milling the faces of the gates for the Panama Canal, although it can also be employed for handling large structural work. The two columns are independently driven by 20-hp. motors having a speed range of from 450 to 1350 rev. per min. and the motion is transmitted from the motor through a pinion and intermediate gear to the large driving gear which is mounted on a horizontal shaft at the side of the upright near the base. This horizontal shaft connects through bevel gearing with a vertical spline shaft which drives the spindle by worm gearing. As is customary in all machines of this type built by this company, the worm wheel has a bronze ring and the driving worm is of hardened steel and both are incased for continuous lubrication. The spindle saddle has square locked gibbed bearings on the uprights and the adjustments for the alignment are made on one shear of the column face. The saddle is counterweighted and a fast vertical adjustment actuated by power and controlled by a conveniently located lever is provided. Power for this traverse is obtained from the vertical spline shaft which extends to the top of the column through a horizontal shaft with a lead screw located in the center of the column. A double train of bevel gears connecting the vertical spline shaft with the intermediate horizontal shaft on top of the column enables the rapid traverse to be reversed. The drive for the feed motion is taken directly from the cutter spindle through spur gears, a worm wheel and two horizontal shafts. One rate of feed only is available at a time, but it is possible by employing a sufficient number of change gears to secure feeds ranging from 0.035 to 0.321 in.

Variable Speed Transmission.—A novel type of gearless variable speed transmission has been brought out by the Fellows Direct Power Transmission Company, Los Angeles, Cal. The driving shaft is directly connected to the engine and has a crank transmitting power through a connecting rod and lever to the gripping device. The grip device which is keyed on the driven shaft consists of a grooved steel disk with a pair of grip ring rocker plates mounted on either side and free to oscillate on the bosses. Eight pins spaced at equal intervals around the rim of these rocker plates have dogs or wedge blocks mounted upon them. The inner ends of these blocks are turned to an arc of a circle whose radius is slightly greater than the distance between the edge of the blocks and the holding pin. These dogs fit into a V in the grooved steel disk keyed on the driven shaft, and in their normal position are radial and just touch the groove. As the radius of the turned ends is greater than the point on which they are swung, these dogs will grip the disks if they are swung slightly in either direction. In this way the driven shaft can be revolved in either direction by swinging the wedge blocks in the proper direction without shutting down the machine. In operation it is customary to use at least three of these transmissions mounted in a set to secure absolute continuity of rotation and it is claimed that from 97 to 98 per cent. of the power imparted to the transmission will be delivered by it.

A 15-In. Double Back Geared Lathe.—The Carroll-Jamieson Machine Tool Company, Batavia, Ohio, is building a 15-in. lathe with double back gears and an improved quick change gear arrangement. This tool is designed for handling an extensive range of work without loss of time in making changes, adjustments, &c. The arrangement of the feed gear box mechanism is such that 30 changes are available for either turning or screw cutting in both directions without the removal of a gear by simply operating one knob and one handle. All the feeds are friction controlled, and the finest is 0.0045 in. The cross slide has ample bearing surfaces, and is fitted with a taper gib. Power cross feed is provided, and the cross feed screw and that for the compound rest have graduated collars. A three-step cone pulley and a 2½-in. belt are employed for driving. The ratios of the double back gears are 8 to 1 and 3 to 1. In designing this tool all the details have received attention, and all the gears are well guarded.

Hydro-pneumatic Pressure Blowers and Vacuum Pumps.—The Nash Engineering Company, 248 Gates avenue, Brooklyn, N. Y., has brought out a hydro-pneumatic pressure blower and vacuum pump, in which all the displacing and joint forming functions are performed by a liquid. The blower consists of the rotor, which is a simple casting having blades cast integral with it, an elliptical casing and an end plate. The casing is filled with water, and as the water and the wheel revolve together, the former follows the casing walls and at first recedes from the rotor, leaving spaces between the blades into which air is drawn. During the next step in the operation, the water is forced back into the wheel spaces, and the air which has entered through ports in the casing is compressed and driven out through the outlet ports.

Double Geared Traction Engine.—The Woods Brothers Thresher Company, Des Moines, Iowa, has developed a double geared type of traction engine. This engine is built with a center crank and two gear trains, one on each side. The special advantages claimed for this construction are the elimination of all side strain and the development of the maximum tractive effort.

Automobile Transmission.—The Coventry noiseless gear box for use on motor trucks and commercial vehicles, shown at the recent Automobile Show in New York, is handled in this country by S. Hoffnung & Co., Ltd., 116 Broad street, New York City. The gear box is capable of transmitting 30 hp. at 1000 rev. per min. The top speed is a direct drive from the engine, the second speed has a reduction of 1 to 1.56 with relation to the engine, the low speed a reduction of 1 to 3.16 and the reverse which is driven by spur gears has a reduction of 1 to 3.37. Three Coventry noiseless chains are involved, each having a pitch of ⅝ in., and the distance between shaft centers is 5.678 in. The gear box is claimed to be of very high efficiency (91 per cent. on full load is guaranteed), and to be absolutely silent running except on the reverse, which is driven by spur gears. It is also declared to have a much longer life than an ordinary spur gear transmission. This type of box has been extensively used by the London Omnibus Company, and all of its latest buses are equipped with it. It is patented in England, and patents have been applied for in this country.

A Portable Grinder With Swing Frame.—The Safety Emery Wheel Company, Springfield, Ohio, has developed an electrically-driven grinder which can be mounted on a pair of steel wheels, equipped so as to be handled by a traveling crane or mounted on a trolley suspended from an I-beam. A 5-hp. motor drives the grinder spindle through a 5-in. belt. Although the machine weighs 1800 lb., it is perfectly balanced so that one man can handle it easily. The motor and the wheel head are supported at opposite sides of a shaft which is free to swing in its bearing in the supporting member but is kept in balance by an adjusting screw which takes care of any variation due to the wear of the wheel. The wheel used is 24 in. in diameter and 3 in. thick. The diameter of the spindle is 2¼ in. in the wheel and ¼ in. less in the bearings which are 5¼ in. long. If safety collars are employed for the grinding wheel, its thickness is reduced 1 in.

Pipe Cutting Tool.—The Taylor-Wilson Mfg. Company, McKees Rocks, Pa., has developed a new tool for cutting pipe in the lathe in which the cutting blade is fastened to the body by two screws and a steel disk located at a suitable angle above the cutting line is adjustably mounted on the frame to accommodate the various sizes handled. This disk nicks the pipe and also prevents the tool from entering the cut too rapidly. Pipe or tubing ranging from ⅝ to 12 in. in diameter can be cut at almost any distance from the chuck, thus doing away with the necessity for a steady rest or work support.

The Machinery Markets

Railroads are becoming more active in their machinery demands in some sections. The Illinois Central has a $30,000 list out in the Chicago market, and the Wheeling & Lake Erie Railroad is asking for bids against a small list. New England machinery men are interested in plans of the Boston & Maine Railroad, which has purchased a large tract of land near Lowell, Mass., as a site for a $3,000,000 repair shop system. The automobile interests are buying in Chicago, and the International Harvester Company has placed some orders against its extensive requirements. Business in Cleveland is hardly holding its own. Some manufacturers there are making tools for stock. The sales outlook for heavy machinery and mining equipment is encouraging in that market. Better reports come from St. Louis where business is improving noticeably. Shop extension plans are bringing out inquiries for large requirements and an excellent single tool business is being done. In Cincinnati the general situation is unchanged, but boilermakers are receiving as much business as in any corresponding season since 1907. Quarry developments are attracting attention in the South and good prospective trade is in sight. Government requirements and mining developments are contributing to the machinery demand on the Pacific Coast. In Texas attention is directed toward the cotton industry, and, judging from the extensions planned and the repair work contemplated, the cotton machinery business promises to be particularly good. Buying is irregular in New York and Philadelphia.

New York

NEW YORK, March 20, 1911.

New inquiries are not plentiful in the New York machinery market, and business was more dull during the last six days than it has been in several weeks. The market seems lacking in snap. Buyers are cautious about placing orders and show a disposition to reconsider their needs. People who have received bids from the trade on machinery requirements are shopping about a great deal and haggling over terms in a manner that indicates they feel they can obtain concessions. This marked hesitancy on the part of prospective buyers has unsettled the market. On the other hand, many machinery houses are busy enough in filling orders placed early in the month and consequently the slight lull now apparent is not bothering them much. The Ontario & Western Railroad has placed a few orders against the list it has out, and a machine shop in Jersey City has been buying lathes and planers. While the machine tool demand on the whole is good, dealers are having no difficulty in getting deliveries from the factories. As a matter of fact, makers of some lines of machine tools, especially milling machines and planers, who were somewhat behind in their orders eight weeks ago, now announce that they have machines in stock for immediate delivery. The export demand is unusually active and promises to continue good. Charles A. Schieren, Jr., of the Charles A. Schieren Company, manufacturer of leather belting, who recently returned from Europe, says in this connection that the outlook there for future business, in Great Britain and Germany especially, is excellent. The demand for leather belting and machinery is steadily and conservatively growing in those markets, and industrial developments now under way in Germany promise to bring out an increased call for mechanical equipment. New York houses dealing in mining equipment report that they are forwarding shipments to Mexico regardless of the disturbances there, and from all accounts mining operations in that country have not been greatly interfered with. There are some good Japanese inquiries out, principally for power machinery, and orders for nearly $20,000 worth of machine tools were placed for a German account through the New York branch of a foreign house this week.

The American Bank Note Company has inquiries out for a large amount of machine tools to be delivered to its new plant at Hunters Point, N. Y. The list consists principally of metal working machinery, and the requirements include a general assortment of machine tools. The company is also buying a line of special machinery, most of which is being built to order.

The De Laval Steam Turbine Company, 165 Broadway, New York, is planning to erect extensive additions to its plant at Trenton, N. J., which will entail an expenditure of $25,000. The addition includes a brick and steel machine shop, 51 x 120 ft.; a storeroom, 60 x 80 ft., and a testing room, 51 x 80 ft., all one-story structures. The list of machinery requirements is now in preparation.

W. S. Rockwell of the W. S. Rockwell Company, 50 Church street, New York, and Martin M. Kalman, are arranging for the location of a plant in the Pittsburgh district for the manufacture of steel car wheels by a new casting process. The W. S. Rockwell Company controls the necessary patents and Mr. Rockwell will superintend the construction and equipment of the plant.

The Public Service Corporation of New Jersey, whose main offices are in Newark, has been authorized to issue $50,000,000 5 per cent. general mortgage bonds, of which $13,850,000 has been subscribed. Of the money raised so far $10,000,000 will be spent in extensions and improvements. Plans are now being made for additions to the company's power stations and extensions to its lines throughout northern New Jersey, which will entail heavy purchases of mechanical equipment.

The Radio Reflector Company, 352-362 West Thirteenth street, New York, has established a department in designing and building special machinery, including die making and tool making to order.

The D. A. Alexander Company, 37-39 Andrews street and 92-94 Mill street, Rochester, N. Y., mechanical engineer and contractor for automatic sprinkling systems, steam power plants and heating and sanitary engineering, is in the market for two pipe machines, 8 and 2 in.; one 3-hp. and one 5-hp. motor and one upright drill. It is putting in new stock. Mr. Alexander was formerly of the Wright & Alexander Company, Inc. Mr. Wright will continue the business of the old company.

The laboratory building of the Cyphers Incubator Company at Fourth and Court streets, Buffalo, N. Y., was damaged by fire March 18 to the extent of $50,000. It will be rebuilt and equipped.

The Rome Wire Company, Rome, N. Y., is completing an addition to its plant of steel brick and concrete, which will be used for the manufacture of Romeoid electric wires, bare and insulated. Considerable new machinery will be installed.

Chicago

CHICAGO, ILL., March 21, 1911.

Business is still below normal though some encouragement is found in this week's market. No large transactions are reported, but an improvement is felt in both inquiries and sales. Purchases for the new plant of the Peerless-V-Belt Company, at Cedar Rapids, Iowa, are reported to have been made. The Moline Pressed Steel Company, Moline, Ill., has bought $2200 worth of machinery, and the Four Wheel Auto Drive Company, Clintonville, Wis., was also a buyer in this market. The International Harvester Company has purchased about $4000 worth of machinery for the Deering and McCormick plants, and its outstanding lists still approximate about $70,000. No large railroad transactions have been closed in the machinery market. The Illinois Central Railroad is out with a list approximating $30,000.

The Osborne High Pressure Joint & Valve Company, Chicago, has increased its capital stock from $200,000 to $300,000.

The Art Metal Fire Proof Door & Trim Company has been incorporated at Chicago with $20,000 capital stock to manufacture metal goods. The incorporators are Thomas P. Shean and Joseph O'Reilly.

Schlick & Johnson, Chicago, have plans prepared for a four-story addition, 100 x 125 ft., to its factory building at 1737 North Paulina street.

The Regal Music Instrument Company, Chicago, has plans prepared for a two-story factory building, 75 x 152 ft., to be erected at Grand and Sawyer avenues. Postle & Mahler are the architects.

Jenney, Mundie & Jensen, architects, Chicago, have plans completed for a five-story factory building, to be erected by

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A. H. Loeb, at the southeast corner of Twenty-second and La Salle streets, which will be occupied by the Troy Laundry Machiery Company. It will be erected at a cost of $115,000.

Bids will be received by the Water Department of the city of Rockford, Ill., March 27, for deep well pumping machinery, electric motors and appurtenances, and pump vaults.

The Freeport Gas Machine Company, Freeport, Ill., maker of gas machines, has purchased additional property upon which it will erect a new four-story factory building of fireproof construction.

The Perfect Stove & Mfg. Company, Belleville, Ill., recently incorporated with $10,000 capital stock, will manufacture a complete line of steel ranges and do a general foundry jobbing business. The company will erect a foundry building in about 30 days, which will be equipped with a cupola, cleaning mills and other foundry equipment. The company desires to hear from parties wanting stoves or castings of any kind manufactured.

The Union Iron Works, Decatur, Ill., manufacturer of elevating, conveying and transmitting machinery, is having plans prepared for a new foundry, 60 x 154 ft.; machine shop, 50 x 135 ft., two stories, and a two-story warehouse and woodworking machinery department, 80 x 80 ft.

The Russell Automatic Gas Machine Company has been incorporated at Rockford, Ill., with $150,000 capital stock by Nelson J. Russell, R. B. Russell and A. G. Parmele.

Sun Prairie, Wis., has voted to issue bonds in the sum of $8000 for the installation of an electric lighting system.

Wausau, Wis., is considering the installation of a municipal lighting plant.

Mishicott, Wis., is planning to establish a municipal lighting plant.

The citizens of Waseca, Minn., will vote at the April election on the question of issuing bonds in the sum of $15,000 for improvements to the electric light plant and water works system.

Perry W. Hearn, Webster City, Iowa, together with the local Commercial League, is interested in the establishment in that city of a large sewer pipe and drain tile plant. The plant will be what is known as a two-press shop, and will require a building, 100 x 400 ft., for drying sheds; a machinery room, 80 x 90 ft.; engine and boiler room, 70 x 80 ft., and a clay storage shed, 90 x 300 ft. Besides these buildings, the proposed plant will require 20 large dry kilns for burning pipe, equipped for using oil or coal, as circumstances may require. The following equipment will be required: Two sewer pipe presses, together with necessary fittings for making pipe from 4 to 36 in.; three sets of wet pans, two dry pans, two piano-wire clay screens, elevators for dry clay and mud, two power elevators, six gravity elevators, trucks and wagons, belting, shafting, pulleys, steam heating system requiring five or six miles of 1½-in. steam pipe, two blowers with engines, steel for kiln bands for 20 kilns, kiln lugs, six 150-hp. high pressure boilers, one 400-hp. Corliss engine, &c.

Palmer & Co., Sioux City, Iowa, will erect two large fruit warehouses, together occupying a space 100 x 150 ft., in which elevators will be installed.

The Jacob Kirschner mill at Fort Dodge, Iowa, was destroyed by fire March 10, causing a loss of $10,000.

The Rock Island Railroad Company's elevator at Council Bluffs, Iowa, was destroyed by fire March 8, together with seven freight cars, causing a loss of $15,000. The insurance is about $7,500.

New England

BOSTON, MASS., March 21, 1911.

The market changes little from week to week. The dealers are doing a steady though not an especially brisk business. Rumor has it that the United Shoe Machine Company is planning further extensions to its great works at Beverly, Mass. A large amount of second-hand machinery is going on the market as a result of this company's purchase of the Wonder Worker Shoe Machinery Company's several works, which contained much that would not be selected for installation in shops such as those at Beverly. The Watertown Arsenal is making preparations for the manufacture of the disappearing gun carriages for the fortifications in the Panama Canal zone, but it is not supposed that new equipment will be required; in fact, the present buildings have room for additional machinery. The navy yards at Charlestown and Portsmouth have felt the effect of the consolidation of manufacturing departments, not on all of the equipment is the various shops being required, which precludes the possibility of any material lists from these sources for some time to come. The most important news of the week is the announcement by the Boston & Maine Railroad of the purchase of a large tract of land at North Billerica, Mass., near Lowell, which will be the site of the great repair shops. They will be built immediately and will cost equipped $3,000,000. This is in addition to appropriations of $150,000 for improvements of the repair shops at Lyndonville, Vt., and $250,000 for the shops at Concord, N. H. In the machinery market prices are being well maintained. The second-hand dealers are not anxious to make sacrifices. In fact, the demand for used machinery is pretty good, everything considered.

The site which the Boston & Maine has acquired at North Billerica, Mass., is on the Southern division, a little less than 22 miles from Boston, and within a few miles of Lowell. The tract contains 550 acres, admirably adapted in grade, soil and geographical location to the purposes to which it will be put. The work of clearing the land will begin immediately, and the erection of the shops will start in the spring, so that the company should be in the market for very long lists of machine tools, cranes and general equipment during the year. Originally it was understood that the appropriation of $3,000,000 for repair shops included other expenditures, especially the $400,000, which will be needed for the enlargements and re-equipments of the Lyndonville and Concord repair shops. But such is not the case. North Billerica will get the entire $3,000,000, with which a group of great buildings will be constructed, having every facility for taking care of locomotive and shop repair. The new building at East Somerville, Mass., which was planned as the original unit of the new works, will be continued as a running repair shop.

The announcement is made that the Orson Automobile Company, New York, with works at Springfield, Mass., will largely increase the capacity of its works. The company consists of 100 stockholders, men prominent in New York business life, and the first cars were taken by these gentlemen for their own use. The purpose is to enter the market in a commercial way, which will mean large extensions of the present shops.

The Whitin Machine Works, Whitinsville, Mass., manufacturer of textile machinery, will build an addition to its foundry, 100 x 500 ft. The present foundry, erected three years ago, is 200 x 500 ft. The new building will be between it and Mumford River. It will be of brick with steel frame and roof.

The machine shop of John W. Burns, Claremont, N. H., was burned March 14 with a loss of $10,000.

The Meriden Fire Arms Company, Meriden, Conn., manufacturer of fire arms, is building a brick addition, 40 x 125 ft., which will be used for the manufacture of tools, the purpose being to have a complete plant independent of local shops.

The Stewart Boiler Works, Worcester, Mass., will build a battery of seven boilers of a new design for the Ann and Hope Mill, Lonsdale, R. I. They will replace seven boilers of the Corliss type, which is a vertical tubular design, with enough tubes missing to permit of the entrance of a man from the top, where there is a dome, which serves for the manhole and for the facing made necessary by the absence of tubes. The boilers will be of the same general design, but much heavier and of higher capacity, the weight of each being 28 tons and its horse power 300. The dome is done away with, a manhole in the top head being substituted. The design permits of some additional tubes.

The Worcester Welding Company, Worcester, Mass., has incorporated under Massachusetts laws, to do autogenous welding, with the purpose of specializing on a portable equipment with which it will do work in the plants of manufacturers. H. G. Wollison, Pittsfield, Mass., is the president and treasurer; F. D. Campbell, Worcester, clerk, and A. P. Lamothe, Worcester, is the third director.

Additions to general manufacturing works include the following: Royal Worcester Corset Company, Worcester, Mass., addition 55 x 165 ft., five stories; Canfield Rubber Company, Bridgeport, Conn., office and factory building, 40 x 150 ft., two stories; Doane-Williams Company, Willimansett, Mass., three-story brick building, 50 x 300 ft.

The General Fire Extinguisher Company, Providence, R. I., will build an addition to its works at Warren, Ohio, consisting of a brick building 150 x 350 ft., to be used for a pipe shop. Considerable pipe cutting machinery will be installed. W. A. Nuracker, second vice-president of the company, is chairman of the committee having the matter in charge.

Cincinnati

CINCINNATI, OHIO, March 21, 1911.

There has been no appreciable change in the manufacturing situation here during the past week. In the machine tool line lathes seem to hold their own, but the demand for other tools is light. Manufacturers of the smaller sizes of generators and motors are enjoying an excellent business,

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but the larger units of electrical machinery are moving slowly.

Boiler makers have experienced a let-up in repair work, but orders for new equipment are coming in fully as frequently as during any previous similar time of the year since March of 1907. Second-hand machinery shows a slight improvement. A few foundries are working at over 65 per cent. of capacity, but the majority are operating below this average about 15 per cent.

Secretary J. M. Manley of the Cincinnati Branch, National Metal Trades Association, has issued a report for three months ended March 15, showing manufacturing plants that are members of the association as operating up to 90 per cent. of capacity. The standard of 100 per cent. is taken for the quarter ended June 15, 1907. The March report is 1 per cent. below that issued December 15 of last year, but this slight decrease is attributed to the very dull holiday season. The lowest average shown since these reports were inaugurated was for the quarter ended September 15, 1908, which was 53 per cent. of the standard given above.

Under the guidance of Profs. A. M. Wilson and L. K. Frankel, the junior class of the Kentucky State University, Lexington, inspected a number of factories in Dayton and Hamilton, Ohio. The plants visited in Cincinnati and Oakley included those of the American Tool Works Company, Cincinnati Milling Machine Company, Cincinnati Bickford Tool Company, Cincinnati Planer Company, Triumph Electric Company, Bullock Electric Mfg. Company and the Cincinnati Gas & Electric Company.

The last meeting, until next fall, of the Foremen's Club, Cincinnati Continuation School, was held the evening of March 17. Prof. J. H. Renshaw, dean of the Continuation School, urged those present to keep up the enthusiasm started, and stated that he hoped and believed the attendance next fall would be even greater than it had been during the past season.

The large additions to the plant of the American Can Company, Hamilton, Ohio, are well under way and are expected to be completed by the beginning of the summer season.

Contract for the additions to the plant of the Superior Gas Engine Company, Springfield, Ohio, recently mentioned, has been awarded to C. Wise, 315 Dearborn street, Chicago, Ill.

The Otto Gas Engine Works of Philadelphia, Pa., has opened an office in the Carew Building, Cincinnati. C. A. Albrecht is in charge and will have as territory the entire Central West.

The Wetterer Brewing Company, Cincinnati, is contemplating making additions to its plant that will require some ice and cold storage equipment.

The Arctic Ice Machine Company has commenced the construction of a 35-ton ice plant for the Avondale Ice Company, Cincinnati.

The Charles Boldt Glass Company, Cincinnati, will spend about $200,000 this year in doubling the size of its present plant in East End. Work on the additions, which will cover about two acres, has already been commenced. All building material and equipment have been contracted for.

New Lexington, Ohio, opened bids for a new water works system last week, but the name of the successful bidder has not yet been announced.

The Miami Power Company is a new Ohio incorporation, with the announced intention of erecting a large hydroelectric plant near Hamilton, Ohio. The incorporators are H. L. Handley and J. W. Durfue of Chicago, W. D. James, Detroit, Mich., and William Berger and John Reif, Overpeck, Ohio. It is stated that S. C. Landis of Hamilton can furnish all particulars.

The Putnam-Hooker Company, Covington, Ky., cotton goods manufacturer, will make some additions to its plant, including a large warehouse.

The Gebhart-Wuichet Lumber Company, Dayton, Ohio, is remodeling its plant. Kirk & Blum, Cincinnati, have contract for installing a large dust collecting system in this factory.

To mine coal and manufacture coke, the Harry B. Clark Coal Company has been incorporated at Fairmont, W. Va., with $25,000 capital stock. The principal incorporators are Harry B. Clark, John A. Clark, Charles H. Waggener and F. E. Roby, all of Fairmont.

The O. O. Poorman Company, New Bremen, Ohio, machinery manufacturer and dealer, has increased its capital stock from $30,000 to $50,000, to take care of some proposed extensions in its business.

The Cincinnati Bronze & Aluminum Casting Company is a newly organized Cincinnati firm, and its foundry has been located in the western section of the city. Martin Burns, formerly foundry foreman for the Lunkenheimer Company, is the leading member of the new company.

It is reported that the National Cash Register Company, Dayton, Ohio, is in the market for a large lot of equipment for proposed additions, included in which are water tube boilers aggregating about 12,000 hp.

The American Sewer Pipe Company, Akron, Ohio, has commenced work on its new plant at Brazil, Ind., which it hopes to have ready for occupancy by July 1.

The City Council of Kenton, Ohio, is planning to establish a $40,000 water works system.

Cleveland

CLEVELAND, OHIO, March 21, 1911.

Reports from the dealers indicate little activity in the local machine tool market. In fact, the volume of business in standard tools is scarcely holding up to that of a month ago. Orders are practically all for single tools, and few inquiries for lots of more than two or three tools are pending. Inquiries are better with some manufacturers outside of the standard line of machine tools, but a number are still engaged in making tools for stock. Inquiries for pneumatic tools and air compressors are very light. In handling machinery the outlook is more favorable. There is a fair and steady demand for small equipment, and some good business is in prospect in equipment for coal handling plants. There is good inquiry for water wheels, and the demand from the West for mining machinery has become quite active. The second-hand machine tool market is quiet.

The Wheeling & Lake Erie Railroad, through its general offices in Cleveland, has an inquiry out for the following machine tools: One 36-in. double back geared screw cutting engine lathe, 8-ft. bed, motor driven; one 24-in. heavy duty back geared crank shaper, with hand operated 16-in. swing cone arbor; one Acme 2-in. single head bolt cutter, with countershaft to cut ⅝ to 2 in.; one 50-in. vertical drill, feeds positively geared, hight about 9 ft., distance spindle to base 62 in., diameter of spindle 2⅞ in., diameter of table 42 in.

The Beard-Stephan Company, Columbiana, Ohio, recently incorporated with a capital stock of $10,000, will manufacture safety devices and an automatic weighing device. A site for a plant has been secured. W. G. Stephan of Cleveland is president of the company and C. E. Beard is secretary and treasurer.

It is announced that the American Can Company of New York will build a large plant in Toledo, Ohio, to replace its present quarters in that city, which have been outgrown. The company has acquired a large site at the head of City Park avenue, near the Lake Shore Railroad.

Plans for the new plant for the Warner Mfg. Company, Toledo, Ohio, are being prepared, and contracts will be awarded about April 1. The company has acquired a site, 532 x 600 ft., on Central avenue and along the Lake Shore Michigan Central Railroad tracks. Two large buildings, one two stories and the other one story, will be erected and will cover nearly the entire site. Both will be of reinforced steel and concrete. The company manufactures axles, motors, gear clutches and other automobile parts.

The Thatcher-Rueter Mfg. Company ,which was recently organized and secured quarters in the Bradley Power Building, 112 Hamilton avenue, Cleveland, has opened a plant for the manufacture of dies, light metal stamping and sheet metal work. Some other lines will be added later.

The Ohio Electric Car Company, Toledo, Ohio, has prepared plans for a new plant, the erection of which it is expected will be started shortly. The new building will be 60 x 240 ft., with a wing 40 x 60 ft. It will be three stories, of mill construction.

With a capital of $15,000 the Kenyon Searchlight Company, Bedford, Ohio, has been incorporated by P. Metzgar, R. H. McKay, P. C. Stoller, E. L. Kichley and Ralph B. Skeels.

It is reported from Sandusky, Ohio, that the Sandusky Foundry & Machine Company is about to close a deal for the purchase of the plant of the Warren Electric Mfg. Company in that city.

The Corux Company, Cleveland, has been formed by Christian F. Heinkel and others to manufacture special tools and appliances.

The American Tire & Rubber Company, Akron, Ohio, which was recently incorporated for $200,000, has about completed a new plant for the manufacture of tires of all kinds. A reclaiming plant is also being built.

The Right o' Way Horn Company, Cleveland, has been incorporated with a capital stock of $25,000 to manufacture automobile accessories. The incorporators are Ira E. Stump, Hugh Pease, W. H. Enyon, F. B. Kavanaugh and C. J. Benkowski.

The Osborn Mfg. Company, Cleveland, has increased its capital stock from $100,000 to $200,000.

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Indianapolis

INDIANAPOLIS, IND., March 21, 1911.

The Motor & Mfg. Company, Indianapolis, has been incorporated with $300,000 capital stock, to manufacture gasoline engines and motors. The directors are W. S. McDonald, J. Olias Vanier and G. R. Brown.

The Fairmount Glass Works, Indianapolis, has authorized an issue of $100,000 preferred stock.

The Easy Trowel & Tool Company, Indianapolis, has been incorporated with $5000 capital stock, to manufacture trowels and other tools. The directors are Chas. W. Fryburger, Samuel J. Rice and J. B. Runner.

The Indiana Electrotype Company, Indianapolis, has been incorporated with $15,000 capital stock; directors, C. A. Patterson, Joseph B. Fleck and John B. Fleck.

The Sheridan Brick Company, Brazil, Ind., has been sold to a new company that will spend $25,000 in improvements. T. C. Hornaday is manager.

The Anderson Trust Company has been appointed receiver of the American Steel Wheel Company, Alexandria, Ind. The plant has been shut down nearly three years.

The Vigo County Clay Company, Terre Haute, Ind., has increased its capital stock from $100,000 to $180,000.

The German-American Stone Company, New Albany, Ind., has been incorporated with $5000 capital stock, to quarry lithographic stone in Harrison County, Ind. The principal stockholders are R. W. Morris, postmaster, New Albany; William Mirchell, Chas. Dorse, Edward Doherty, J. B. James, W. V. and P. C. Bulliet, all of New Albany, and Dennis J. Lincoln and William Ashbrath of Louisville, Ky.

The Haynes Auto Company, whose plant was recently destroyed by fire, at Kokomo, Ind., has increased its capital stock from $600,000 to $800,000.

The Globe Stove & Range Company, Kokomo, Ind., has increased its capital stock from $250,000 to $500,000.

The East Side Carriage Company, Indianapolis, has been incorporated with $5000 capital stock, to manufacture vehicles. The directors are Marion O'Harra, J. W. Potter and C. A. Johnson.

The Superior Fluorspar & Lead Mining Company, Evansville, Ind., has been incorporated with $50,000 capital stock, to develop the fluorspar field of Hardin County, Ill. Dr. P. H. McCoy, Evansville, is president of the company.

The H. G. Christmas Construction Company of South Bend, Ind., has the contract for the erection of one of the principal buildings of the Oliver Chilled Plow Company's new plant at Hamilton, Ont., the contract price being $235,000.

The Northern Indiana Gas & Electric Company has been incorporated with $5,000,000 capital stock. It is a consolidation of the South Shore & Electric Company, Indiana Harbor & East Chicago Electric Company, Plymouth Lighting Company and Whiting Electric Light Company. Clarence G. Geist, Philadelphia, is president; Samuel T. Bodine, vice-president, and Lewis Lillie, secretary.

The Remy Electric Company, Anderson, Ind., has redeemed the small amount of former preferred stock, has made a new issue of $500,000 preferred and has increased its common stock to $500,000.

The Portland Cement Tile & Block Company has been incorporated at Portland, Ind., with $15,000 capital stock, to manufacture cement products. The directors are Joseph M. Minch, C. J. Beard and L. P. Beard.

The Sneath Glass Company, Hartford City, Ind., has increased its capital stock to $200,000.

The Ballard Cement Fence Post Company, Newcastle, Ind., has been incorporated with $10,000 capital stock by George and G. M. Ballard and Edward Smith.

The Wabash Power Company of Logansport, Ind., plans to build a dam and power plant at Georgetown, Ind. Among the stockholders are Judge Quincy A. Adams of the Indiana Supreme Court, Logansport; Walter Osmar, former city engineer, and O. H. Binns, secretary of the Casparis Stone Company.

The Bedford Stone & Construction Company, one of the large contracting companies of Indianapolis, has increased its capital stock from $100,000 to $200,000.

The Waring Glove Company, Decatur, Ind., which also has plants at Huntington and Rochester, Ind., is to have a fourth at Wabash, Ind., which will erect for the company a stone building of two stories, 50 x 100 ft.

The National Boat Company has purchased the Western Launch & Engine Works of Michigan City, Ind. The plant is to be improved and may be equipped for shipbuilding.

Herbert Epperson, son of James Epperson, Indiana State Mine Inspector, has been appointed to superintend the electrical mining machine and drill display of the Linton, Ind., Mining Company at St. Petersburg, Russia.

The Cleveland Construction Company has the contract for the erection of the new factories of the Haynes Auto Company, which suffered a loss of its plant at Kokomo. It will be of concrete and steel. The insurance companies decided to pay the full face of the policies, amounting in all to $240,000. The Apperson Automobile Company of Kokomo gave temporary employment to 125 of the Haynes Company's workmen.

The C. J. Olsen Mfg. Company has been organized at Pittsboro, Ind., to manufacture combined insulators and lightning arresters and sanitary window sash; incorporators, C. J. Olsen, W. F. Hiatt and C. A. Weaver.

Pendleton, Ind., has sold $6000 of bonds for the purpose of installing a municipal electric lighting plant.

The Southern Indiana Power Company, a merger of the Bedford Power Company, Bedford, Ind., and the Shoals Power Company, Shoals, Ind., has marketed $800,000 in bonds to pay for a dam and power plant now being built at Williams, Ind., and another to be erected at Shoals.

The Jasper Novelty Works, Jasper, Ind., is building a $10,000 addition to the plant, four stories, 40 x 150 ft. It will be used for the manufacture of desks.

The Western Indiana Mining Company has been organized at Terre Haute, Ind., with $15,000 capital stock to mine coal. The directors are H. B. Talley, W. E. Eppert, G. E. Talley, James Johnson and J. A. Templeton.

The Louisville & Northern Railway & Lighting Company will improve its plant at Charlestown, Ind., by the installation of a new engine and other equipment.

The Lindenschmidt Company, Evansville, Ind., ornamental and builders' iron work and iron fencing, is erecting a new building, 30 x 55 ft., to be used as a blacksmith shop, which it will equip with a 250-lb. steam hammer, already purchased. Alterations are also being made in the company's present shop, which will be equipped with additional machinery as soon as the blacksmith shop is moved into the new building. The company is not in the market at the present time, but expects to purchase a planer later on.

The Evansville Marine Motor & Foundry Company has been incorporated at Evansville, Ind., and is planning the erection of a plant which when completed will cover one-half a block. The plans include an office building, assembling department and machine shop, which will be equipped with machinery for the manufacture of marine and stationary gasoline engines. B. F. Drury is president of the company.

St. Louis

ST. LOUIS, MO., March 20, 1911.

Business the past week has been productive of some pretty fair orders. One of the dealers furnished several tools to a plant in Quincy, Ill., and disposed of some heavy second-hand machines taken in trade. Other good business in heavy tools pending for some time has been placed.

The Government is in the market for an open side planer for the arsenal shop here.

A number of the large plants have important improvements under way involving large expenditures, which promises inquiries for fair lots of equipment in due time.

New manufacturing concerns continue to incorporate and get ready for business, and a number of those announced during the past week will require extensive machine shop outfits. The railroads are not buying anything of any consequence as yet. Business in the Southeast is looking up, and that section is expected to improve as a tool consumer rapidly from now on.

The Hansen Continuous Chemical Fire Apparatus Company, St. Louis, has been incorporated with a capital stock of $50,000. Dr. F. William Runde is president; Edward M. E. Hansen, vice-president, and L. A. Ragan, secretary. The company will manufacture a chemical fire engine invented by E. M. E. Hansen.

The J. W. Boyd Grain Company, Joplin, Mo., will erect a combined elevator, warehouse and corn meal plant in East Joplin, at Railroad and Hill streets. The estimated cost will be $12,000.

The city of Granby, Mo., will soon place bonds, the proceeds of which will be used for the construction of a new water works system.

Bids will shortly be received at Rolla, Mo., for the construction of a steel bridge across the Piney River, at Newburg, Mo. The engineer is at work on the plans and specifications for the bridge.

The city of Independence, Mo., has arranged with the Missouri Pacific Railroad with reference to the construction of a bridge across the railroad tracks on the South Side boulevard. Construction will begin at an early date.

The County Commissioners of Fayette, Mo., have approved the report for a new bridge at the foot of Moore's Hill.

The Little Rock Railway & Electric Company, Little

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Rock, Ark., has plans prepared for the installation of new pumps and condensers for the intake system of its plant. A new 2500-kw. steam turbine was recently installed by the company.

Mound City, Kan., is having estimates prepared for a water works system.

The Electric Light & Power Company, Alliance, Neb., has been purchased by the city, which will make a number of improvements to the plant.

Armour & Co., Omaha, Neb., have contracted for the installation of a sprinkling system in their plant at South Omaha. They are also erecting a new machine shop building, which they will equip with the machinery transferred from their present shop. No additional equipment will be required.

The Waurika Ice & Electric Company, Waurika, Okla., has increased its capital stock from $50,000 to $75,000, and will make a number of improvements to its plant.

The Oklahoma Rubber Company, Oklahoma City, Okla., has been incorporated, with $400,000 capital stock, and will immediately commence the construction of a plant for the manufacture of rubber goods, to be ready for operation by May 1. The plant will be erected on an eight-acre tract and will consist of a one-story concrete building, 100 x 200 ft. and a two-story office building, 25 x 50 ft. All the necessary rubber manufacturing machinery has been purchased, but the company is in the market for a 150-hp. oil engine, a 100-hp. steam engine and a 6 ft. by 18 ft. 100-lb. pressure steam boiler.

The Salt Lake Auditorium Association, Salt Lake City, Utah, is receiving figures on equipment to be installed in the Salt Lake Auditorium, a building 102 x 190 ft. The floor of the building will be covered with about 90,000 of 1-in. pipe, laid 1 in. apart, with double head supply for the artificial ice skating rink. The plant will also have a capacity of 50 tons commercial ice daily.

Alamosa, Colo., is having plans prepared for a $25,000 water works system.

The McIntosh Car Seal & Mfg. Company, Denver, Colo., will be moved to Greeley, Colo., and its output greatly increased. F. E. Stockover of Greeley is interested in the company.

The Jacont grain elevator at Anselmo, Neb., was destroyed by fire March 11, causing a loss of $10,000.

The foundations for the new oil mill, light and ice plant at Hollis, Okla., are being laid. The three plants are to be completed within four months.

Philadelphia

PHILADELPHIA, PA., March 20, 1911.

Buyers continue to place orders in a conservative manner and the volume of business closed recently does not show any material gain. Machine tool dealers report orders small individually and negotiations under way proceed slowly. Second-hand machinery merchants note but little change in recent conditions; sales continue light, although an occasional better demand for certain classes of equipment is to be noted. Locomotive builders are taking on a somewhat better run of orders, and several fair contracts are under negotiation, but the bulk of the demand of late has been for small lots. From present indications a better run of locomotive business is expected in the not distant future. Builders of the usual standard types of machine tools are not taking orders very freely, and make but meager gains in the productive rate. Special tools and machinery, particularly the latter, have developed irregularity, builders in several instances reporting fewer orders. Conditions in the general foundry trade are practically unchanged, although in instances steel casting plants note an increasing demand for certain classes of work. The movement in boilers, engines and general power equipment, both new and second-hand, continues quiet.

The contract for the erection of the warehouse and coal storage yard for the Curtis Publishing Company, at Eleventh and Washington avenues, reference to which has been previously made, has been given to the Wells Brothers Company, New York. The warehouse will have a storage capacity of 20,000 rolls of paper and the coal storage yard a capacity of 10,000 tons. Frank C. Roberts & Co. are the engineers, and will also have the placing of the contracts, it is said, for the power equipment and other engineering propositions, which, however, they are not yet prepared to consider.

The Williamson Brothers Company has let a contract for the erection of a six-story pattern storage building, to be built at Edgemont and Boston streets. The structure will be of mill construction, 62 x 100 ft., and the only equipment required will be an elevator. This concern has under consideration the erection of an addition, 70 x 250 ft., to its machine shop and an addition to its power house. Additional power equipment of 300 kw. capacity has already been provided for. It will be in the market for some equipment in the way of tools for its machine shop, but states that it is too early to consider the nature of its requirements at this time.

M. A. Metz & Brother, manufacturers of knitted goods, are considering the erection of a five-story brick factory building, 42 x 66 ft., at the corner of Sixth and Spring Garden streets. Bids for the work are now being taken. It has not yet been decided whether a power plant will be installed or whether electric power will be purchased.

The Link Belt Company, Nicetown, is considering extensive alterations to its offices, and also portions of its plant, made necessary by the change in grade, due to the elevation of the tracks of the Philadelphia & Reading Railway, adjoining its plant. This company is estimating on a large amount of work of all kinds and considers the business outlook very favorable.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for two second-hand, standard gauge, six-driving wheel switching engines, with a wheel base not to exceed 11 ft. 6 in. Tenders may be either square or sloping. The engines should weigh 50 to 75 tons on drivers, the heavier preferred.

The Darby School Board, Darby, Pa., is considering the advisability of introducing a system of manual training in its higher schools, and it is said that the property committee has been instructed to secure the probable cost of the necessary apparatus and equipment.

A bill has been passed by the Senate of the State of Delaware authorizing the city of Clayton, Del., to borrow up to $40,000 for the construction of a municipal lighting plant, after having first submitted the proposition to its voters, for which a special election is to be held.

A charter has been granted the United Railway Company, under the laws of the State of Pennsylvania, to operate an electric line between Humbert and Barronsville, Somerset County, Pa., a distance of seven miles. The capital is $70,000 and the following incorporators are named: I. W. Seamans, Uniontown, Pa.; T. B. Palmer, B. A. Smith, L. W. Fogg, J. H. Palmer, D. D. Johnson and Harold W. Seamans, all of Uniontown, Pa.

Engineers received bids last week for a one-story pumping station for the borough of Spring Lake, N. J. The building will be 62 x 94 ft. The Joseph L. Swiegard Company, this city, is the engineer.

The Carbon Iron Works, Lehighton, Pa., has been incorporated, with a capital stock of $30,000, and will engage particularly in the manufacture of sadirons. The officers of the company are: President, William S. Koch; secretary and treasurer, George E. Gray; directors, Henry Kresge, U. G. Smith, Oscar J. Saeger, Charles G. Moll and Howard L. Arner. The company states that it has a building which will answer for its manufacturing purposes, but makes no reference to its requirements in the way of equipment.

Detroit

DETROIT, MICH., March 21, 1911.

Manufacturers are unable to complain of any lull in the continued prosperity. March has been a remarkable month for the amount of new business it has brought to firms of this city, and if conditions do not take any noticeable slump, it bids fair to make a record month. The fact that the auto accessories market has taken such a brace since the first of the year is a source of much gratification to many concerns. Building, in matter of new factories, has not been as active as last year, but all space is being utilized.

One of the most important companies to incorporate the past week is the Detroit Wheel Company. This company is incorporated with a capital stock of $1,000,000, to manufacture a patent spring wheel for motor cars. The company will also make vehicles of all kinds. The bulk of the stock is held by Charles R. Chisholm.

The Detroit Range & Boiler Company is planning several improvements to its present plant. One item is the erection of a one-story factory building.

The Canfield Mfg. Company has incorporated with a capital stock of $5000. The company will make plumbers', builders' and molders' supplies, also leather goods. Edmund B. Tompkins is the principal stockholder.

The D. & S. Specialty Company, principally controlled by James F. Draper, has filed articles of incorporation. The company has a capital stock of $10,000, and will manufacture stove pipes and stove accessories.

The Pilgrim Scale Company has organized with a capital stock of $25,000. It will manufacture a patent scale. The organization is in the hands of Robert Mearns, the principal stockholder.

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The Ottawa Leather Company, Grand Rapids, Mich., maker of leather products, has increased its capital stock from $100,000 to $200,000.

The Lake Superior Iron & Chemical Company is planning to erect at its plant at Newberry, Mich., new chemical and retort factories. Both buildings will be constructed of steel and brick. The chemical plant will be contained in a building 60 x 160 ft., and the retort plant in a building 72 x 300 ft.

The American Handle Company, Grand Rapids, Mich., is negotiating with the city of Houghton for the erection of a plant there.

Anson E. Wolcott and associates have acquired the old Mount Clemens Health Food Building and incorporated a new company, to be known as the Wolcott Milling Company.

Manistee, Mich., will vote on the proposition to bond the city for $90,000 for the erection of a complete municipal electric lighting and water works plant.

Escanaba will vote on the question of bonding the city for $30,000, to be used in the construction of a gas plant.

Hiram Smith, the inventor of the Interlocker silo machine, expects to locate a factory for the production of his invention at Paw Paw, Mich., if satisfactory arrangements can be made.

The Cleveland Cliffs Iron Company will construct a $100,000 power plant near Eagle Mills, Mich., on the Carp River. The power developed will be used for its mining properties and the Pioneer furnace.

The Menominee River Brewing Company, Menominee, Mich., is to construct a large addition to its bottling department. The new building will be 40 x 130 ft. in size and will be equipped with new machinery.

The National Chicory Company awarded last week contracts to the Bay City Stone Company for the erection of two plants, one at Kawkawlin and one at Piconning, Mich., the approximate cost of which will be $60,000. The plants will be finished by September 1, to allow the installation of machinery in time for the fall campaign.

L. L. Conkey, Grand Rapids, Mich., will erect a two-story factory for the manufacture of operating tables for veterinary purposes. The factory will be of cement and will be equipped with modern machinery.

Brown & Schler, Grand Rapids, Mich., will begin operations in May for the erection of a brick two-story factory, 50 x 75 ft. Modern machinery for the dressing of all kinds of hides will be installed.

The Light & Power Commission of Marquette, Mich., has decided to ask for the submitting to vote the proposition of bonding the city for $100,000, to cover the cost of construction of two new power dams and improvements to the lighting plant.

The Cadillac Cabinet & Construction Company, Cadillac, Mich., will build a new carpenter shop, 35 x 60 ft. in size, and one story. The shop will be equipped with a band saw, shaper, two turning lathes, a combination rip and cut-off saw, boring machines and emery grinders. Details are in the hands of Gilbert Sluyter.

The Mills Mfg. Company, at present located at Hudson, Mich., will move its plant to Adrian.

The Village Council of Pewamo, Mich., is in the market for a chemical engine of 90 gal. capacity.

The Elliott Machine Company, Grand Rapids, Mich., is contemplating the construction of a new plant, and is looking for a suitable site. It plans to bring its three scattering shops under one roof, and will greatly enlarge the plant's capacity.

Saginaw, Mich., will submit at the April election the question of bonding the city for $85,000, for the construction of a new bridge.

The Colonial Furniture Company, Grand Rapids, Mich., is the name of a new company incorporated last week for the purpose of manufacturing furniture and carvings. The company has a capital stock of $10,000. Among the incorporators is James Van Keulen.

At the April election Benton Harbor, Mich., will vote on the proposition of issuing bonds to the amount of $100,000, for the erection of a suitable water plant.

The Sun Oil Company, Grand Rapids, Mich., has presented a petition to the City Council asking for permission to construct a new oil plant. It is planned to increase the capacity of the plant, as well as secure a more favorable location.

The David Stott Milling Company suffered the loss of its Adrian, Mich., plant through a disastrous fire March 18. The mill is a complete loss, amounting to about $60,000. Mr. Stott states that the plant will be rebuilt immediately.

The citizens of Marquette, Mich., will vote at the April election on the question of issuing $1,000,000 in bonds for increasing the water power and electric generating capacity of the city's municipal plants.

The citizens of Hastings, Mich., will vote at the April election on the proposition of bonding the city for $120,000 to establish a water power plant, which will operate a municipal electric plant and pumping station.

The City Council of Harrison, Mich., is planning the construction of a water works system.

The City Council of Kalamazoo, Mich., has under consideration the following questions: The disposals of its lighting plant and the purchase of electricity for its street lights and municipal buildings, re-equipping its present municipal lighting plant, or the construction of an entirely new plant.

Extensive improvements will be made by the Pere Marquette Railroad at Saginaw, Mich., including remodeling of the machine shops and the erection of an extension to the roundhouse, which will more than double its capacity.

The Olds Motor Works, Lansing, Mich., will commence work in the near future on an addition to its plant, 74 x 758 ft., which will increase its present manufacturing facilities by about 50 per cent. The building will be three stories and basement, and will be used for assembling purposes. The company will also build large docks at the railroad lines connected with its plant, which will greatly benefit its shipping facilities.

The T. C. Beach Company, St. Johns, Mich., recently incorporated with $10,000 capital stock to manufacture furniture specialties, states that it will use electric power for the present, and that it has all the machinery it needs to start with, but later on it will be in the market for a large equipment of woodworking machinery.

Toronto

TORONTO, March 18, 1911.

While the Canadian market for equipment has been growing greatly under every head, there has been notable expansion in the demand for hydroelectric power plant equipment, for mining outfit and for pulp and paper making machinery. It is not by any means to be said that business is more active or in greater volume in these than in other classes, but that in them it has quite rapidly swollen out from very small to very large dimensions, and gives every promise of steadily increasing in importance. In these reports reference has been made from time to time to the installation of large power plants at various points, and to heavy expenditure on mine equipment. More recently the application of capital to new pulp and paper mills has received some notice in these columns. Toward the end of the last century and early in this one there was quite an outburst of enterprise in the pulp and paper making industries of Quebec, and several large works came into existence. This was followed by a long halt, but the advance movement has now begun again, and there are expectations of a very great growth in the country's pulp and paper making capacity. It is chiefly in Quebec and Ontario that the new mills are to go up, though projects of magnitude are announced for New Brunswick and British Columbia. In all these provinces the local governments have indicated a determination to reserve the Crown lands pulp wood for the use of domestic manufacturers, and three of them now impose restrictions on the exportation of timber from these lands. The Laurentide Paper Company, Grand Mère, Que., is making financial arrangements for a large increase in manufacturing capacity. A new paper mill is to be built at Sault Ste. Marie, Ont. The Spanish River Pulp & Paper Company has obtained the money for the construction of a big paper mill in connection with its pulp mill at Espanola, Ont. Price Brothers & Co., Quebec, Que., will begin at once to spend the $5,000,000 recently raised for the building of new paper mills. Great paper mills to cost $10,000,000 are to be erected at Grand Falls, N. B. Several Quebec pulp and paper companies are preparing to extend their works.

The directors of the Laurentide Paper Company, whose mills are at Grand Mère, Que., have decided to increase the capital stock, probably to $10,000,000. It is now not quite half that amount.

The Lake Superior Paper Company has been organized, with $8,000,000 capital stock, to build and operate a paper mill at Sault Ste. Marie, Ont. A bond issue has already been underwritten in England. The ground pulp mill and the sulphite fiber mill of the Lake Superior Corporation have been acquired by the company.

At the annual meeting of the Bank of British North America the chairman referred to the large number of branch factories established by United States companies in Canada, and said that if the widening market here was

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enough to tempt American enterprise to start factories on this side of the line, the same policy ought to be good for British manufacturers. As the bank is owned in Great Britain, and as the remarks were addressed to British hearers and readers, there may be some response to the suggestion.

The City Council of Hamilton and the Board of Trade of Brantford, important manufacturing cities in Ontario, have passed resolutions against the reciprocity pact. In both resolutions it was affirmed that one effect would be to stop the coming of American branch factories.

The Northern Ontario Light & Power Company has been incorporated, with a capital of $7,500,000, to take over the light and power systems of Cobalt and Harleyville and the hydroelectric plant now supplying power to the mines in that district.

In the House of Commons this week the Minister of Railsways and Canals stated that the Government will proceed at once to construct 170 miles of the Hudson Bay railway.

Contracts will shortly be let for additions to the plant of the Page-Hersey Iron Tube & Lead Company at Welland, Ont. The additions are to cost $200,000. In the same town the Canada Steel Foundry Company's plant will be expanded at an outlay of $100,000. The business belonged to the Ontario Iron & Steel Company until it was recently taken into the Steel Foundry Company's system. Quality Beds, Ltd., is arranging to build a 60 x 80-ft. addition to its factory in Welland. The Canada Forge Company there is preparing to increase its output by 20 per cent. Plans are being worked out for the laying of an 8-in. pipe line from Welland to Selkirk as a natural gas conduit.

The Canadian Board of Railway Commissioners has approved railway terminal improvements at Halifax, N. S., to cost about $2,000,000.

Sir William Mackenzie, president of the Canadian Northern Railway Company, says that the company's plans this year call for the construction of 600 miles of new line.

It is announced that the Grand Trunk Pacific Railway Company will build 140 new stations in the West this summer, and that the Canadian Pacific Railway Company will open 50 new towns on its Western lines before the end of the year.

The Ontario Hydroelectric Power Commission is about to call for tenders for the material for 8 or 10 miles of transmission line from a point on the Severn River to the towns of Midland and Penetanguishene, on Georgian Bay. Material and equipment for necessary transformer stations will be included.

The capital stock of the British Columbia Steel Corporation, recently incorporated under Dominion laws, is $10,000,000. The chief place of business is to be at the city of Toronto. It is stated that a rail mill and a plant for rolling ship plates will be built. Port Mann, the Pacific terminus of the Canadian Northern Railway, continues to be mentioned as the point at which the works will be located. It is stated that the United Engineering & Foundry Company, Pittsburgh, Pa., has prepared plans and estimates for the plant. According to accounts given for publication, there are to be seven open hearth steel furnaces, of a total output of 850 tons per day.

The London Foundry Company, London, Ont., will increase the capacity of its plant this summer.

The St. Lawrence Flour Mills Company is building a mill of 2500 bbl. output per day on the Lachine Canal, Montreal. There will also be an elevator built to hold 400,000 bu. of wheat.

The City Council of Sherbrooke, Que., has decided to construct a municipal power plant at Rock Forest, to cost $100,000.

The Canadian Pacific Railway Company is beginning the construction of a 16-story office building at the principal corner in Toronto.

The city of Regina will make extensions, costing $100,000, to its municipal power plant.

Freight sheds to cost $100,000 are to be built by the Canadian Pacific Railway Company at its Place Viger station, Montreal.

The rate-payers of Calgary will vote on bylaws to raise $380,000 to be applied to electric light extensions and $60,000 to be expended on conduits.

The Gillette Razor Company is to build a $100,000 factory this year. A site has been got in Montreal.

The Cobalt Lake Mining Company, Cobalt, Ont., has decided to erect a concentrator of 20 stamps, capable of treating 100 tons of ore.

Sir Thomas Shaughnessy, president of the Canadian Pacific Railway Company, has announced that his company will spend $14,000,000 on the construction of Western branch lines this year, the total to be added being 500 or 600 miles.

A mill, a tramway and air compressors are to be built at the Standard Mine, Silverton, B. C., by the American interests that have acquired that silver-lead property.

The Western Wire & Nail Company, London, Ont., has decided to enlarge its plant. A new factory that, with the equipment, will cost $250,000, is to be built.

The Hobbs Mfg. Company, maker of glass goods, London, Ont., is making extensive improvements in its plant.

The total outlay for the new plant, wharves, buildings, mains, &c., the Vancouver Gas Company is about to make is estimated at $1,500,000, of which $600,000 is to be laid out this year.

The Government of British Columbia has granted to Point Grey, Vancouver, $130,000, and to Richmond, another suburb, $135,000, for roadway improvement.

The contract to build 84 miles of the Alberta Central Railway from Stettler, Alberta, to the Brazeau coal fields has been awarded to J. D. McArthur, Winnipeg. The work is expected to be finished by the autumn.

The Independent Tire Company, Toronto, which has been recently incorporated, is negotiating with the City Council of Peterborough, Ont., for terms to erect and operate a factory in that city. It is prepared to increase its paid up capital to $350,000, to build a factory, and install $75,000 worth of machinery therein if the municipality will lend it $40,000. The matter is under consideration. Automobile tires are to be made.

The Albert Mfg. Company's plaster mill at Hillsboro, N. B., was destroyed by fire. It employed from 100 to 120 hands when in full operation.

The Hudson Bay Company will begin the construction of its million dollar store in Calgary, Alberta, in a few weeks.

San Francisco

SAN FRANCISCO, CAL., March 15, 1911.

A few orders are coming in for single tools of fairly large size, principally from shops in San Francisco and Alameda County, but this class of business is still rather closely limited. The outside trade is still confined for the most part to small tools, the total volume showing little change. Plans are under way for extensive additions to a few shops in the interior, but little definite inquiry is coming out as yet. It is announced that the Mare Island Navy Yard will shortly start work on a coaling steamer for the Navy, which would probably necessitate the installation of a few large tools, though in a general way the plant is already well equipped.

The market for general equipment has been somewhat hampered by bad weather, but in the last few days there has been considerable activity, and orders are about to be closed on several large inquiries for mining and quarry machinery. A fair demand is noted from the lumber industry in northern California, incident to the reopening of numerous logging camps, though the lumber trade so far has been below expectations. All lines of road building machinery find an exceptionally active demand, which is expected to continue for the next six months. At present work is being rushed to repair the roads and bridges damaged by the recent storm, and quick delivery is desired on much of the equipment ordered. There has been some expectation of a demand for contractors' equipment in San Francisco, but so far the local market has been quiet, as the machinery purchased during the rush a few years ago is still in good condition, and is sufficient to take care of any work immediately in prospect. Municipal inquiries are very numerous, especially for water works and power machinery.

The gas-operated electric power plant, the gas for which is generated from crude oil within the unit, installed by the Allis-Chalmers Company for the Holton Power Company, Holton, Cal., is receiving considerable attention, as it appears to embody the most economical method of using crude petroleum which has been introduced.

W. T. Garratt & Co. will move their offices, brass foundry and finishing shop into their new building at Fremont and Folsom streets about the end of the week.

Charles P. Bannon, formerly with the American Steel Casting Company and previously assistant superintendent of the Joshua Hendy Iron Works, has opened offices in the Sheldon Building under the name of the Bannon Engineering & Machinery Company. He is acting as general sales manager for the steel casting department of the C. L. Best Gas Traction Company, and represents the Gardner line of grinding machinery.

E. P. Jamison & Co., Seattle, Wash., have opened a San Francisco office at 741 Monadnock Building, under the management of Fred B. Wright, formerly of Chicago. The company handles a general line of railroad equipment and contractors' machinery, carrying stock at Seattle, Tacoma, Portland and Spokane. A warehouse will probably be opened in San Francisco later in the year.

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H. M. Byllesby, president of H. M. Byllesby & Co., Chicago, is inspecting his lighting and power properties on the coast, with a view to general improvements to be carried out during the year.

The Western Machine & Foundry Company, Santa Barbara, Cal., is planning to erect new buildings for its plant, with additions to the foundry department.

J. M. Frink, president of the Washington Iron Works, Seattle, Wash., was a recent visitor in San Francisco.

Adams & Hollopeter, manufacturers of lighting fixtures, &c., have leased a two-story building on Natoma street, between Fourth and Fifth, for foundry purposes.

The first application for space at the Panama-Pacific Exposition in 1915 was received from the Joshua Hendy Iron Works, which proposes to occupy 20,000 sq. ft., with a complete mining plant in operation. An application has also been received from the Standard Gas Engine Company of this city.

Work is now under way on the new plant of the Warman Steel Casting Company at Redondo, Cal.

H. H. Severin has opened a small machine shop at Modesto, Cal.

Preliminary plans are being made for the power plant for the Geary street municipal railroad in San Francisco, and funds have been set aside for a power plant in the Hall of Justice Building.

The Vulcan Iron Works, San Francisco, recently shipped to Osaka, Japan, a complete 25-ton Vulcan ice-making plant, including ammonia compressor, with direct connected Corliss engine, open air ammonia condenser, ice-making tanks, crane, distilling and purifying apparatus, boiler system, &c. This company is installing a 35-ton refrigerating machine at the Alexandria Hotel, Los Angeles, and has received an order for a 45-ton motor driven refrigerating plant from the John B. Agen Company, Seattle, Wash.

The Honolulu Consolidated Oil Company has placed an order with the Bessemer Gas Engine Company of Pennsylvania for six 80-hp. gas compressors, to be installed at its wells near Maricopa, Cal. The company proposes to manufacture gasoline from natural gas.

New projects for the installation of alfalfa meal mills are being started in many parts of California.

The supervisors of Solano County, Cal., have purchased a 12-ton Austin road roller, and propose to spend about $7000 for additional road equipment.

The Temescal Clay Products Company, Los Angeles, Cal., is planning to establish a large pottery plant near Corona.

The city of Los Angeles, Cal., will be in the market shortly for a steam shovel for aqueduct work.

It is reported that Oakland interests are preparing to establish a cotton mill at San Diego, Cal.

It is reported that the Salt River Valley Water Users' Association, Phoenix, Ariz., is in the market for two hydraulic turbines of 2500 hp. each, direct connected to electric generators.

The Covina Irrigating Company, Covina, Cal., has let a contract for a lot of pumping machinery to the H. N. Tracy Company, Los Angeles.

The Truckee Lumber Company is preparing to add a box factory and sash and door mill to its new lumber mill near Oroville, Cal.

Benj. Cunha and others are planning to install an electric lighting plant at Halfmoon Bay, Cal.

The San Diego Planing Mill, San Diego, Cal., is preparing to replace a lot of equipment which was recently destroyed by fire.

The Bullion Hill Mining Company, operating near Merced, Cal., has let a contract to the Jardine Machine Company, San Francisco, for the installation of a Krogh tube mill, a Huntington mill, machine and blacksmith shops, and three Union gas engines of 74-hp. aggregate capacity.

The San Francisco city engineer is making plans for several fresh water pumping stations for the city.

The city of Los Angeles, Cal., will open bids April 3 for engine generator sets to be installed in the Hall of Records.

The town of Lodi, Cal., is in the market for a gas engine of about 75 hp.

The Risdon Iron & Locomotive Works, San Francisco, has levied an assessment of $5 per share.

Orland, Cal., is having estimates prepared for a $50,000 water works and power plant.

Active preparations are being made by the Blume Construction Company, San Francisco, for the early completion of the Western Pacific Railroad shops, which are being erected here. Concrete foundations for the buildings are already completed, and it is expected that the entire group of buildings will be completed and ready for occupancy by the first of June.

The Curtis Power Boat Company, Portland, Ore., has increased its capital stock from $10,000 to $100,000, and will erect a new plant for the manufacture of boats of all kinds and sizes. A complete line of wood working machinery will be installed, together with air compressor, air drills, drift bolt drivers, hammers, &c. Electric hand drills, seamers, &c., will also be installed.

The South

LOUISVILLE, KY., March 21, 1911.

Although there is a good deal of prospective business in the market, machinery manufacturers and dealers report the situation just now rather quiet. Quarry developments continue to supply a considerable volume of trade, while reports of probable automobile manufacturing projects indicate a demand for machine tools in that direction a little later on.

A company is being formed in Louisville with $100,000 capital stock for the manufacture of an electric automobile. Several models have been built in a local plant, and when experiments with these are completed the company will be organized and a plant erected. Those connected with the enterprise have declined to make details public, but it is promised that additional facts will be forthcoming in a few weeks.

Longest Bros. & Co., this city, have placed the Longest motor truck on the market. It is built in the 3 and 5 ton models. Members of the company state that while the plant is equipped fully at present, the probable increase in the number of cars turned out will require additional machinery later on.

Veeder B. Paine, manager of the Mengel Mahogany Logging Company at Axim, Africa, has been in Louisville for the purpose of looking at some improved logging equipment which may be purchased for use in connection with the company's operations on the West Coast of Africa. The company is controlled by C. C. Mengel & Brother Company, Louisville.

The elevating and conveying machinery contract for the new concrete cement bins just completed at Speed's Station, Ind., for the Louisville Cement Company has been let to the Webster Mfg. Company, Chicago. The order was placed through E. D. Morton & Co., Louisville.

A 10-ton electric elevator is to be installed in the new warehouse of the J. I. Case Threshing Machine Company, which is to be erected in this city in the near future.

The city of Louisville is considering the erection of a plant for the disposal of garbage. David R. Lyman is chief engineer and M. W. Neal is chairman of the Board of Public Works.

Work has been begun on the viaducts of the Big Four and Chesapeake & Ohio railroads in this city, which will relieve the congestion of freight in the East Louisville yards. The contract for the structural iron work, involving a considerable tonnage, was let to Grainger & Co., Louisville, while B. C. Milner & Son received the contract for the piers, which will be built of reinforced concrete. The cost of the viaducts will reach $600,000. The contracts for the work were awarded from the office of the chief engineer of the Big Four at Cincinnati.

Harry B. Driver will head a new laundry company, which will erect a modern plant near Sixth street and Broadway, Louisville. Mr. Driver is president of the Elite Laundry, and will install a lot of new equipment, including power and laundry machines.

It is probable that the plant of the Southern Wall Plaster Company, Louisville, which was destroyed by fire, will be rebuilt. E. J. Kollross is general manager of the concern.

Changes are to be made in the building of the Norton Company, at Fourth avenue and Market street, Louisville, including the installation of an electric elevator. George W. Norton is president of the company.

The transfer of the securities of the Lexington & Interurban Railways Company, Lexington, Ky., from the Guarantee Trust & Safe Deposit Company of Philadelphia to the newly organized Kentucky Securities Company, which is controlled by Philadelphia interests, will open the way for the financing of improvements of the street railway and other public service properties at Lexington, including the building of a $500,000 power house.

Wingo, Ky., has developed plans for a water works system and is constructing a 90,000-gal. reservoir. Power machinery of limited capacity will be required.

According to a statement of R. B. Hutchcraft, Lexington, Ky., who has been engaged as engineer by the Freeborn Construction Company, Kansas City, Mo., that company is beginning the erection of a cement mill at Pine Hill, Ky.,

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which is to have a daily capacity of 1600 barrels a day. A tract of 2200 acres of limestone lands has been purchased from Col. J. A. August of Washington, D. C.

The Paintsville Water & Light Company, Paintsville, Ky., has filed articles of incorporation with $20,000 capital stock. H. M. Stafford and John E. Buckingham are the incorporators. Details regarding the company's plans have not been announced.

The Louisville & Nashville Railroad is preparing to spend $50,000 in improving its facilities at Russellville, Ky. New shops will be built and equipped.

A cut stone plant is being equipped at Bowling Green, Ky., by the Bowling Green Quarries Company, of which Samuel Pickles is manager.

A steam roller for street work may be purchased by Madisonville, Ky. Councilman Cooke is chairman of the street committee.

The Rublesco Mfg. Company, Seattle, Wash., is to remove its plant to Memphis, Tenn., arrangements having been made by R. M. Austin, manager of the company, with the Business Men's Club of Memphis. The concern manufactures household specialties.

City officials of Memphis, Tenn., who are investigating the question of establishing an electric light plant, are also considering the installation of a garbage incinerator.

A. B. Lamb, Paris, Tenn., is organizing a company for the establishment of water works and an electric plant at Lexington, Tenn. A franchise is to be awarded him in the near future.

Clarksville, Tenn., is now preparing specifications for the water works plant to be built there. Bids will be open about May 1, plans having been drawn by Hazlehurst & Anderson, Atlanta. Two turbine centrifugal pumps will be purchased, among other items.

Petersburg, Tenn., is arranging to have electric lights, a local flour mill having made plans to install a dynamo and furnish the service.

The Synder Airbrake Indicator Company, Knoxville, Tenn., has been organized, with $50,000 capital stock, by O. A. Synder, J. B. Jones, R. J. Yearwood and T. G. McConnell. A plant will be built for the manufacture of the indicator, which is a patented safety device, and has been tried out on engines of the Southern Railway.

Work has been begun at Memphis, Tenn., by the Nashville, Chattanooga & St. Louis Railway, which has purchased a site for a considerable extension of its facilities, including the enlargement of its roundhouse.

The Appalachian Knitting Mills, Knoxville, Tenn., will move into the buildings formerly occupied by the Knoxville Woolen Mills Company, and will increase its capacity by the installation of new machinery.

Electric elecators will be installed in a five-story building to be erected in Chattanooga, Tenn., for the DeRossett Hat Company. J. G. Barnwell and Clarence T. Jones are the architects.

England & Bryant, Newport, Tenn., are planning the erection of a power plant on Pigeon River, near Newport, for the purpose of producing electric power with which to operate a tannery which they now control and another which is to be erected this summer.

John Adams, Newport, Tenn., is organizing a company for the development of manganese deposits at Yellow Springs, Tenn. George F. Young, Zanesville, Ohio, and John L. Doan, Marietta, Ohio, are interested in the enterprise. A contract for the equipment has been awarded to John P. Duncan & Co., Knoxville, Tenn.

Arrangements having been made whereby the Knoxville Water Commission will extend its mains to Lonsdale, Tenn., the company which was to have been formed there for the purpose of establishing a plant will not be organized.

A contract has been let to W. J. Oliver, Knoxville, Tenn., for the construction of a railroad from Charlotte, N. C., to Greenville, S. C. It is stated that water power will be developed along the route and electricity produced for the operation of the line, electric locomotives of a new type being employed. The Duke interests are understood to control the new railroad.

A water works system to cost $5000 will be established at Marks, Miss.

It is reported that a $50,000 company is being organized at Gadsden, Ala., for the manufacture of soil pipe and radiators. The Business Men's Club of Gadsden has offered a bonus of $5000 for the establishment of a plant by the company.

The plant of the Gadsden Pipe & Fittings Company, Gadsden, Ala., which was destroyed by fire, will be rebuilt.

The Gulfport & Mississippi Coast Traction Company will build an electric light and power plant at Handsboro, Miss., the city having granted a franchise for that purpose.

An electric light system will be built at Newton, Miss., at a cost of $11,000, a bond issue of that amount having been authorized.

The Arkansas Kerosolar Light, Gas & Fuel Company has been incorporated at Little Rock, Ark., with $40,000 capital stock. A. Danville is president of the company.

Notice has been received here that the spring manufacturing plant of the Independent Steel Company of America at Kenova, W. Va., may be continued until it is shown that it is not a paying proposition. The order regarding this was entered by Federal Judge Dayton at Charleston, W. Va. The company is in the hands of receivers.

The Central Foundry Company, Anniston, Ala., is making an addition to its molding department, 45 x 125 ft. Contract has been awarded to Wolsoncroft & Powell. Details as to equipment are not as yet completed.

The City Council of McDonough, Ga., is making plans for an electric light plant. J. B. McCrary & Co. will make surveys of the city and submit plans.

The Huntsville Gas Light Company, Huntsville, Ala., has been taken over by the Huntsville Gas Light & Fuel Company, a corporation composed of Philadelphia capitalists with $300,000 capital stock. It is understood that the new owners will make extensive improvements.

A saw mill to cost $150,000 and a box factory to cost the same amount will be erected about two miles east of Morgan City, La. A company with a capital stock of $300,000 has been organized, most of the stock of which has been taken by local citizens. The mill is to be built on a lot of 20 acres and construction will begin at once, the plans having been drawn and the contract let.

The Memphis Artesian Water Department, Memphis, Tenn., will immediately begin the construction of a handsome warehouse building adjoining the Auction avenue pumping station, the cost of which will be approximately $30,000. The construction will be of brick and reinforced concrete. The building will be equipped with conveying trolleys and with a large revolving crane for unloading from cars. A railroad track will run along one side of the warehouse. Jones & Furbringer are the architects.

Texas

AUSTIN, TEXAS, March 18, 1911.

An unusually large number of cotton gins will be erected in Texas between now and the opening of the next cotton harvest. Machinery for many new gins has already been ordered, and a general rehabilitation and renewal of old gins are in progress. In south Texas the increase of the cotton acreage is causing new gins to be erected in many localities.

An election will soon be held at Eagle Lake, Texas, to vote on the proposition of issuing $30,000 of bonds for constructing a water works plant and a sewer system for the town.

Kolar & Kristek will install new machinery in the old cotton gin at Flatonia, Texas, which they recently purchased.

The town of Marquez, Texas, is developing a large water supply for its water works system by drilling wells.

The Farmers' Union Warehouse Company, Taylor, Texas, is making good progress with its plans for erecting a cotton ginning plant to cost $25,000 and a 500-ton seed house at that place. J. R. Hargis is president.

W. J. Meininger will install a new cotton gin at Rosenberg, Texas.

The Rosenberg Mill and Elevator Company, Rosenberg, Texas, recently increased its capital stock from $10,000 to $20,000. It will make improvements to its mill.

G. H. Mohle is remodeling and rebuilding his cotton gin at Lockhart, Texas. The plant will be enlarged and new machinery installed.

The City Council of La Grange, Texas, has leased the municipal water works system of that place to John H. Killough. He will install improvements. The lease is for a period of 10 years.

The City Council of Temple, Texas, has taken preliminary steps to install a garbage crematory at that place.

The interurban railway system that is being constructed out of San Benito, Texas, to various points in the lower valley of the Rio Grande will be extended to Santa Maria and Mission, about 75 miles. S. A. Robertson of San Benito is largely interested in the road and is doing the construction work. It is reported that a syndicate of St. Louis, Mo., men are financing the project.

Alenso Gerard is preparing to erect a plant at Houston for the manufacture of incubators.

A. W. Dibrell has installed an irrigation pumping plant

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and constructed a large water storage reservoir near Seguin, Texas, and is prepared to irrigate a large tract of land.

The recent election at Caldwell, Texas, on the proposition to have the city construct a water works plant, standpipe and distributing system carried and the contract for the work will soon be let. An artesian water supply will be developed for the proposed system.

T. S. Blake will install a new cotton ginning plant at Plantersville, Texas.

Plans have been adopted for the erection of a 1000-ton sugar mill at San Benito, Texas. It will cost about $1,000,000. Alba Heywood of San Benito can give information.

The Kerrville Electric Light & Power Company will extend its lighting system at Kerrville, Texas.

Plans are on foot by a syndicate of Pittsburgh, St. Louis and Beaumont men to lay a natural gas pipe line from the Caddo field, near Shreveport, La., to Orange, Texas, Beaumont and Port Arthur. The line may be extended to Houston later on. The secretary of the Commercial Club at Orange, Texas, can give information in regard to the project.

The Northern Texas Traction Company, Fort Worth, Texas, is securing right of way for its proposed interurban electric railway that is to be constructed from Fort Worth to Cleburne. This company has merged the Dallas-Sherman interurban railway with its Fort Worth-Dallas line.

G. C. Mountcastle of Fort Worth and associates are establishing an extensive system of irrigation near Pecos, Texas. Pumping plants will be installed.

The Consolidated Reservoir & Irrigation Company of Grand Falls, Texas, which recently took over the holdings of the Big Valley Irrigation Company, the Grand Falls Lake & Reservoir Company and the Grand Falls Mutual Irrigation Company will, it is announced, spend about $600,000 in enlarging the merged irrigation system. Large storage reservoirs and canals will be constructed and pumping plants installed.

C. S. Hoffman, representing a boat building company of Kingsboro, Mass., has been investigating the situation at Tampico, Mexico, with the view of establishing at that place a large motor boat manufacturing plant.

The Pachuca Foundry & Machine Company, Pachuca, Mexico, will install new machinery and make other improvements. This company has the contract for the construction of the aerial tramway, 3½ miles long, of the Pachuca & Real del Monte Company at Pachuca. The towers are being built of structural steel. The tramway will have a capacity of 400 tons of ore per day of 10 hours.

The Mexican Eagle Petroleum Company of the City of Mexico will construct an oil pipe line and pumping stations along the route, from the Potrero del Llano oil field, in the State of Vera Cruz, Mexico, to Tampico, about 110 miles. This company is also said to have in contemplation the erection of an oil refinery at Tampico to cost about $2,000,000 gold. It has placed orders for an enormous amount of steel tankage material.

The Mexican Petroleum Company, which has general offices at Los Angeles, Cal., has obtained a concession from the Mexican Government for the construction of an extensive system of irrigation near Valles, State of San Luis Potosi, Mexico. It will install pumping plants, build canals and make other improvements.

An election will be held at Las Cruces, N. M., on May 9, for the purpose of voting on the proposition of issuing $40,000 of bonds for the construction of a water works plant and distributing system and $35,000 for the construction of a sewage disposal plant.

The American Beet Sugar Company is still at work on its plans for the establishment of a beet sugar factory at Portales, N. M., to cost about $1,500,000.

Hearne, Texas, has plans completed for a water works system.

Clarksville, Texas, will expend $60,000 for enlarging its water works system.

The Weisenborn Mfg. Company, Port Houston, Texas, is erecting the initial building of its new plant, and it will be ready for the machinery to be installed in a short time. A foundry for the making of all castings used by the company will also be built, together with a galvanising plant. The company expects to employ about 500 men when the entire plant is completed.

The Eroe Bed Mfg. Company, Port, Houston, Texas, is erecting two buildings. They will be 75 x 390 ft., and will provide ample room for the installation of a large complement of modern metal bed making machinery. The capital stock of the company is $200,000. One hundred men will be employed.

The Dardinelle Handle Company is negotiating for a location at Houston, Texas, with a view to erecting a factory there. The Timpson Handle Company of Timpson, Texas, is financing the company.

Bids are being advertised for the new bridge across Shoal Creek on the Rankin Lake road, southwest of Greenville, Texas. Bids will be received by the highway commissioners for both concrete and iron bridges.

Government Purchases

WASHINGTON, D. C., March 20, 1911.

The Paymaster General, Navy Department, Washington, will open bids April 4, under schedule 3396, class 82, for 10 back geared screw cutting engine lathes.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids April 11 for one radial drill, schedule 3436; two electric hoists, schedule 3435, and one band saw, schedule 3437.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids May 2 for one electric traveling crane for Mare Island, Cal.

The Construction Quartermaster, Honolulu, T. H., will open bids April 1 for construction of pump house and installing pumping machinery at Fort Ruger.

The Constructing Quartermaster of Fort Mason, Cal., will open bids April 4 for reconstructing pump house, installing machinery and erecting a water tank.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids March 14, schedule 3378 and class 94, for four blowers and one set of spare parts as follows: Bidder 41, Diehl Mfg. Company, Elizabethport, N. J., $1750 and $1770.50; 54, Griscom Spencer Company, New York, $1580; 66, General Electric Company, Schenectady, N. Y., $1210; 128, B. F. Sturtevant Company, Hyde Park, Mass., $1473, and 143, Vermilye & Power, New York, $1560.

The American Rolling Mill Company, Middletown, Ohio, in a pamphlet just issued entitled "The Proof—American Ingot Iron Rust-Resisting," presents testimony from a number of authorities tending to substantiate the claims made for the rust-resisting properties of this company's products. A list of "articles giving best service when made from American ingot iron" includes 38 classes, alphabetically arranged, beginning with auto body sheets and ending with wire fences. Illustrations are given of roofing and siding, spiral lath, conductors, culverts and fence wire in which ingot iron is used, also a comparison of the sizes of steel and ingot iron articles, after immersion for the same time in an acid bath. In every case the steel articles showed the greater loss in volume.

The Brightman Mfg. Company, Shelby, Ohio, manufacturer of shafting and shafting machinery, has awarded the contract for the construction of its new plant at Columbus, Ohio, to the McClintic-Marshall Construction Company, Pittsburgh, Pa. The plant will be located on Marion road, on the Toledo & Ohio Central Railroad, and will consist of a building 132 x 400 ft., with an ell 60 x 100 ft., of steel and brick construction. The contract for all equipment has also been let to the construction company. The office of the Brightman Company has been moved to Columbus, where all mail should be addressed.

S. Wolberg & Co., dealers in white metal, solder and tin stock, Front and Queen streets, Philadelphia, Pa., have incorporated their business under the laws of Pennsylvania with capital stock of $10,000, as the Wolberg-Robinson Metal Company. Samuel Wolberg is president; I. Brod treasurer, and L. C. Robinson secretary. The company is preparing to move from the old location to a new plant at 805 Washington avenue, in the same city.

The S. Obermayer Company, foundry supplies and equipment, Cincinnati, Chicago and Pittsburgh, announces that its New England branch is now located at 44 Stonehurst Street, Dorchester, Boston, Mass., with William Fitzpatrick, Jr., in charge. Any inquiries or orders for foundry facings, supplies and equipment forwarded to that branch will have immediate attention.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¼ in. round and square	₩ ℔ 1.75¢
1½ to 4 in. x ⅜ to 1 in.	
1½ to 4 in. x ¼ to 5-1	₩ ℔ 1.85¢
Rods—⅜ and 11-16 round and square	₩ ℔ 1.85¢

Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.00¢
3 in. x 5-16 in. and ⅛ in.	2.25¢
1½ to 2½ in. x ⅛ in.	2.10¢
1½ to 2¾ in. x 3-16 in. and thicker	2.00¢
1 to 1¼ in. x 3-16 in.	2.10¢
1 to 1¾ x ⅛ in.	2.20¢
⅞ x ⅛ in.	2.30¢
¾ x ⅛ in.	2.40¢
⅝ x ⅛ in.	3.45¢
½ x 3-32 in.	4.25¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.25¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

	Black: One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 16	₩ ℔ 2.55¢	2.80¢
Nos. 18 to 20	₩ ℔ 2.70¢	2.90¢
Nos. 22 and 24	₩ ℔ 2.75¢	3.00¢
No. 26	₩ ℔ 2.80¢	3.10¢
No. 28	₩ ℔ 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ ℔ 12 @14½

Patent Planished, W. Dewees Wood, ₩ ℔ A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ ℔ 2.95¢
Nos. 22 to 24	₩ ℔ 3.30¢
No. 26	₩ ℔ 3.50¢
No. 28	₩ ℔ 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ ℔ 5.75¢
No. 26	₩ ℔ 6.25¢
No. 28	₩ ℔ 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.90
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. Charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20, 107 ℔	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 12, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ ℔

High Brass Rods—

List August 1, 1908. 14½¢ ₩ ℔

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ ℔

Brass Wire—

List August 1, 1908. 14½¢ ₩ ℔

Copper Wire—

Base Price. Carload lots mill 13½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ ℔ 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ ℔ 40½@40¾ ¢

Copper—

Lake Ingot	₩ ℔ 14¾@15 ¢
Electrolytic	₩ ℔ 14⅝@14¾¢
Casting	₩ ℔ 14¼@14⅝¢

Spelter—

Western ₩ ℔ 6¼@6⅜¢

Zinc.

No. 9, base, casks ₩ ℔ 8 ¢ | Open ₩ ℔ 8½¢

Lead.

American Pig	₩ ℔ 5 @5¢
Bar	₩ ℔ 6½@6¾¢

Solder.

½ & ½, guaranteed	₩ ℔ 23 @23½¢
No. 1	₩ ℔ 26 @26½¢
Refined	₩ ℔ 23½@24 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ @10¾¢
Hallett's	@10¾¢
Other Brands	@9½¢

Bismuth—

Per ℔ $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 31¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ ℔ 10.75@11.00
Copper, Heavy and Wire	₩ ℔ 10.50@10.75
Copper, Light and Bottoms	₩ ℔ 9.50@ 9.75
Brass, Heavy	₩ ℔ 7.00@ 7.25
Brass, Light	₩ ℔ 5.50@ 5.75
Heavy Machine Composition	₩ ℔ 9.25@ 9.50
Clean Brass Turnings	₩ ℔ 7.00@ 7.25
Composition Turnings	₩ ℔ 8.25@ 8.50
Lead, Heavy	₩ ℔ @ 3.75
Lead, Tea	₩ ℔ @ 3.50
Zinc Scrap	₩ ℔ @ 4.00

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Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

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